# PAINT and VARNISH Production

THE TECHNICAL MAGAZINE FOR MANUFACTURERS OF PAINT, VARNISH, LACQUER AND OTHER SYNTHETIC FINISHES

ADVANCE
ZIRCO

• DRIER CATALYST

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This the front cover of the new, soon to be published booklet on Advance ZIRCO Drier Catalyst 6%. ZIRCO is the revolutionary new product, developed by Advance Research Laboratories, that is daily winning new friends in the Protective Coatings Industry.

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OCTOBER
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| Phthalic Anhydride (Min. on Non-Volatile) | 43% | 42% |

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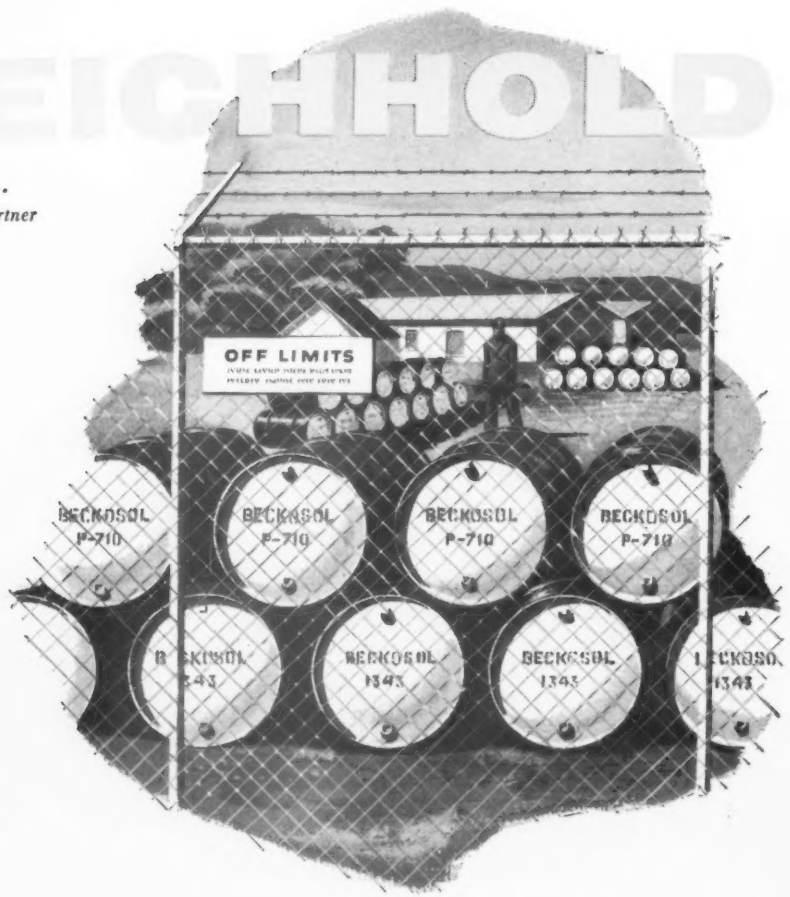


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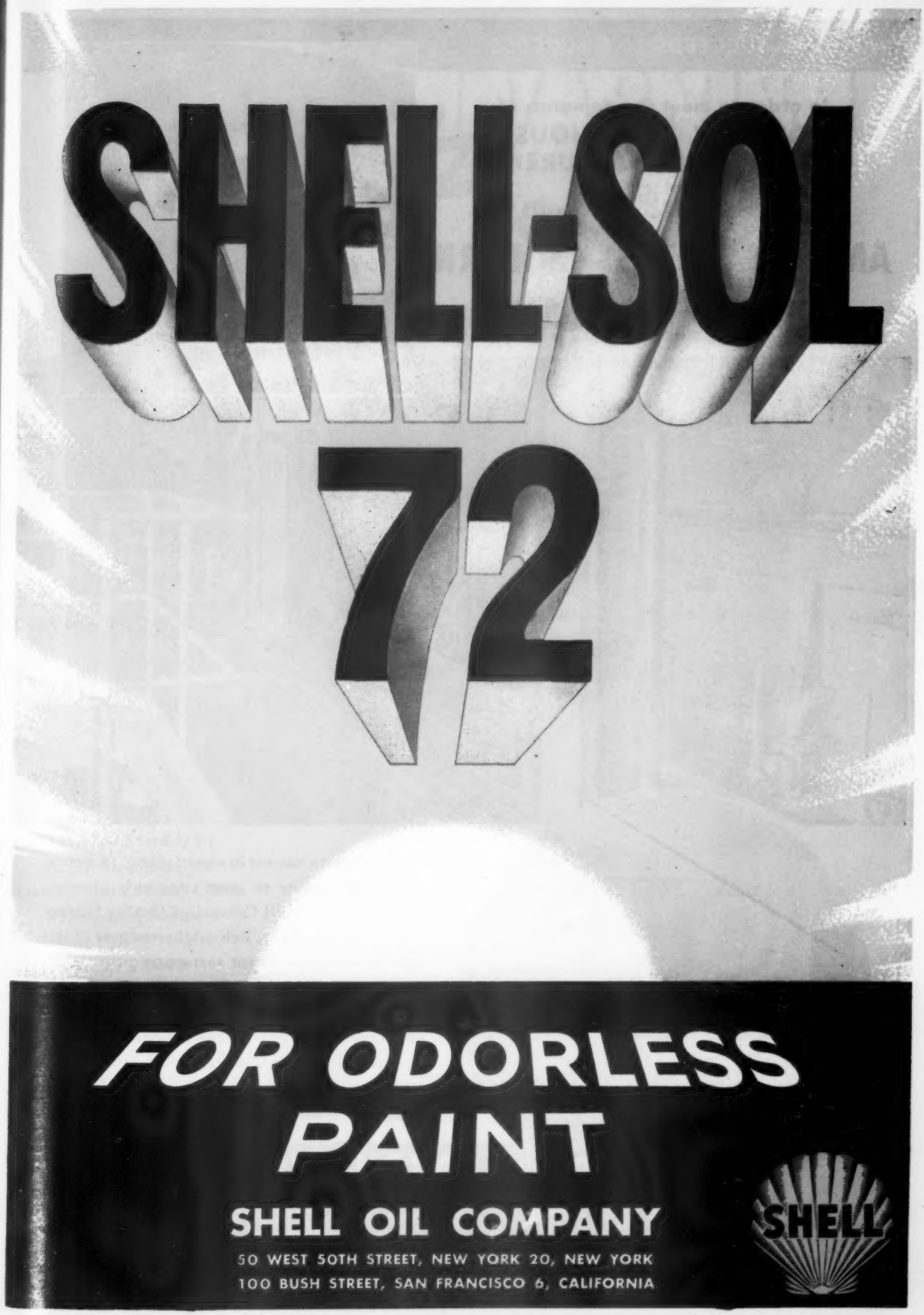
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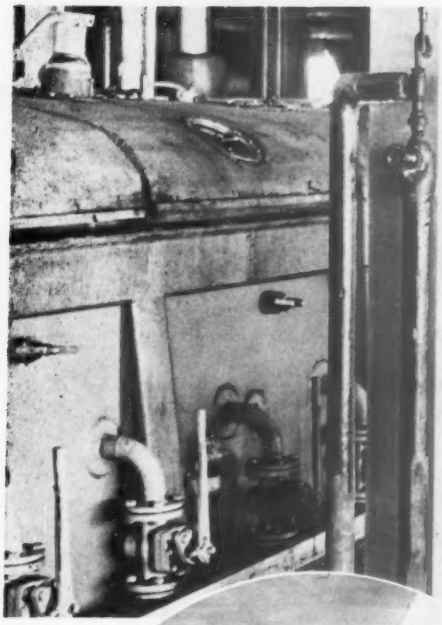

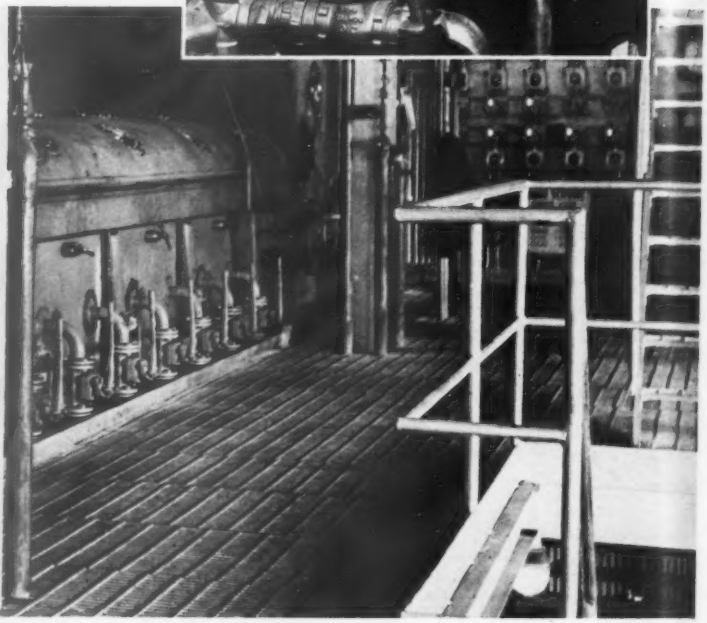

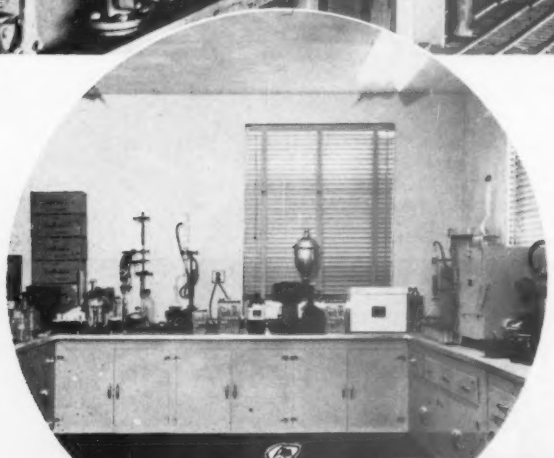

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# PAINT and VARNISH Production

(REG. U.S. PATENT OFFICE)

Formerly PAINT and VARNISH PRODUCTION MANAGER
(Established in 1910 as The Paint and Varnish Record)

VOL. 44 OCTOBER, 1954 NO. 10

NEXT ISSUE

In conjunction with the Annual Paint Conventions scheduled for the week of November 15th in Chicago, we are pleased to announce that our November issue will be an all-convention number. Details regarding the programs of both the National Association and the Federation, together with a listing of all exhibitors at the Paint Industries' Show will be included in this issue.

A special feature of this convention number will be a series of exclusive articles covering the recent developments and trends in resins and vehicles for the formulation and manufacture of industrial finishes.

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Published Monthly by
Powell Magazines, Inc.
Executive and Editorial Offices
855 Ave. of Americas
New York 1, N. Y.
BRyant 9-0499

JOHN POWELL, *Publisher*
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PAINT and VARNISH PRODUCTION is published monthly at Easton, Pa. by Powell Magazines, Inc. John Powell, president; Ira P. MacNair, vice-president and treasurer; Alice L. Lynch, secretary. Entered as second class matter at Post Office at Easton, Pa., Jan. 30th, 1952, under the Act of March 3, 1879. Subscription rates: United States and Possessions, $3.00 a year, $5.00 for two years, $10.00 for five years. Single copies 50c each. Canada, $4.00 a year. Pan American Countries, $4.00 a year. All other countries $8.00. Editorial and business office: 855 Avenue of the Americas, New York 1, N. Y. BR-9-0499.

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# Editorial Comment

October, 1954

### For the Benefit of All

NEXT month during the week of November 15th, the National Paint, Varnish and Lacquer Association and the Federation of Paint and Varnish Clubs will hold their respective conventions in Chicago.

As was jointly announced by both organizations earlier, this will be the last time that both groups will meet during the same week and in the same city. The decision to hold separate meetings was initiated by the Federation officials who felt that their expanding organization will be best served by regional meetings and an earlier annual meeting. This will permit greater flexibility in selecting annual meeting cities and hotels by both groups. Other factors considered by the Federation were better hotel accommodations will be available for members of both organizations and for exhibitors; executive and technical personnel will not be absent from their business simultaneously; and the Federation convention can be extended to three or four full days.

It should be a matter of pride that the industry at large has progressed to the point that it has become expedient to make this move. In the interest of serving the paint industry to the fullest extent, this decision to hold separate meetings will unquestionably be of greatest benefit to all. Both organizations should be complimented on making such a far-reaching decision.

### About Our Convention Issue

AS HAS been customary in the past, the November issue of PAINT AND VARNISH PRODUCTION has been designated as the Convention number.

In the interest of keeping the technical men of the paint industry abreast of important developments, this special issue will carry a series of articles dealing with recent trends and developments in resin technology for the manufacture of industrial finishes.

Top resin technologists will provide up-to-the minute information on such important resins as acrylics, alkyds, cellulosics, polyamides, epoxies, phenolics, hydrocarbons, vinyls, amino types, chlorinated rubber, and silicones. A special feature of this series will be the presentation of some of the problems that manufacturers of industrial finishes are facing today.

For the latest in resin and vehicle technology for industrial finishes, be sure and see our November issue.

### Paint Versatility

PAINT has so many different uses, but here is one application which caught our fancy.

The September issue of the *Farm Journal* related a new and provocative idea—spraying sheep with plastic and aluminum paint to keep them cool and clean. According to the article, some sheep raisers in New Mexico are currently trying out such a paint and have come up with some interesting results.

It is believed that if the paint is sprayed on after shearing, it will bind tufts of wool together, keep out dirt, and reduce shrinkage from grease to a clean basis. By reflecting the summer sun, and holding in winter heat, food energy will be conserved. Those who have experimented with this novel idea report that sprayed sheep have cleaner fleece, the paint scours easily at the mill, and the sheep are not harmed by the treatment.

Cost of the paint, and putting it on, runs 40 to 50 cents a head, but it is felt that this cost could be cut in half with large-scale production.

Incidentally, the inventor of this treatment has already made application for a patent.

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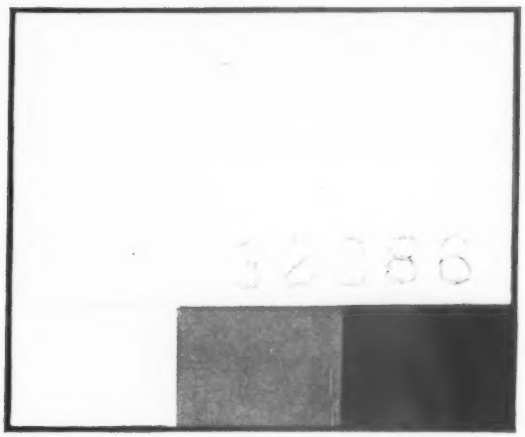


**Here's the result of controlled chalking—beauty and an ideal surface for repainting—assured by the proper amount of Eagle-Picher AAA Lead-Free Zinc Oxide.**

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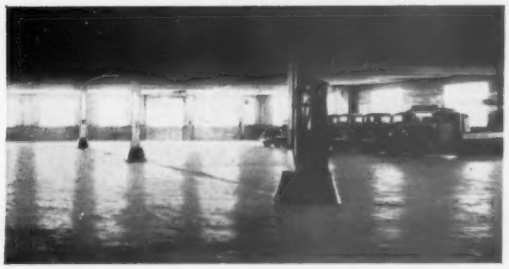
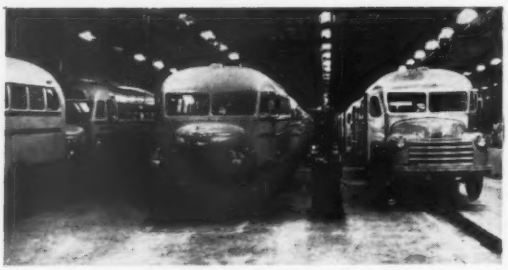
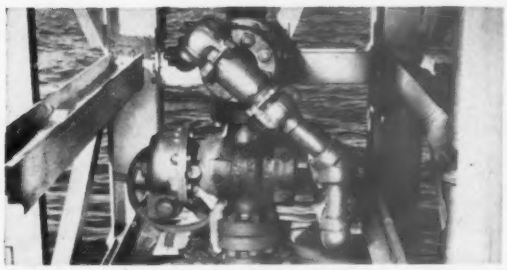
**for the CHEMICAL INDUSTRY:** It's a big market for your coatings. And BAKELITE Resins give the performance that makes satisfied repeat customers. For example: on storage tanks for gases and solvents, an oil-base system deteriorated badly after only one year. Tanks finished with a coating system based on BAKELITE Vinyl Resins remained in top condition with no detectable corrosion.



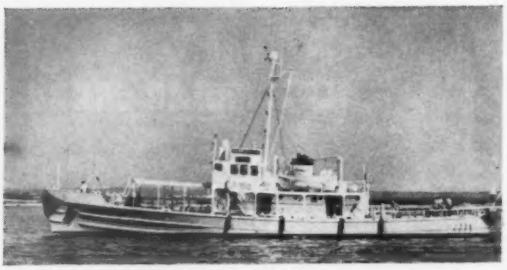
**for the BUILDING INDUSTRY:** You can formulate for all types of surfaces, increasing your sales package. For concrete flooring, an air-dry enamel finish, based on BAKELITE Phenolic Resins showed less than 10% wear after five years of heavy truck traffic and operations of this bottling plant and warehouse.



**for the AUTOMOTIVE INDUSTRY:** Primers, as well as finish coats, are a source of big volume. With BAKELITE Vinyl Butyral Resins you can formulate wash primers that bond firmly to aluminum and steel without flaking. They provide a firm grip for topcoats, and prevent creepage of corrosion even when topcoats are scratched.



**for the PETROLEUM INDUSTRY:** Offshore wellheads of two major oil companies used to require a full-time continuous painting program. Now, with a coating system based on BAKELITE Vinyl Resins this costly maintenance has been replaced with routine check-ups. The new finishes are permanently neutral, chemical resistant, non-oxidizing and non-heat-reactive.



**for the MARINE INDUSTRY:** Weather, rough service, salt-water and corrosive cargoes all demand tough coatings. You can sell this market with tested finishes based on BAKELITE phenolic resins for superstructures, interior metalwork and equipment, deck varnishes, and anti-fouling coatings for below the waterline. Tests show continued perfect protection after more than three years' service.

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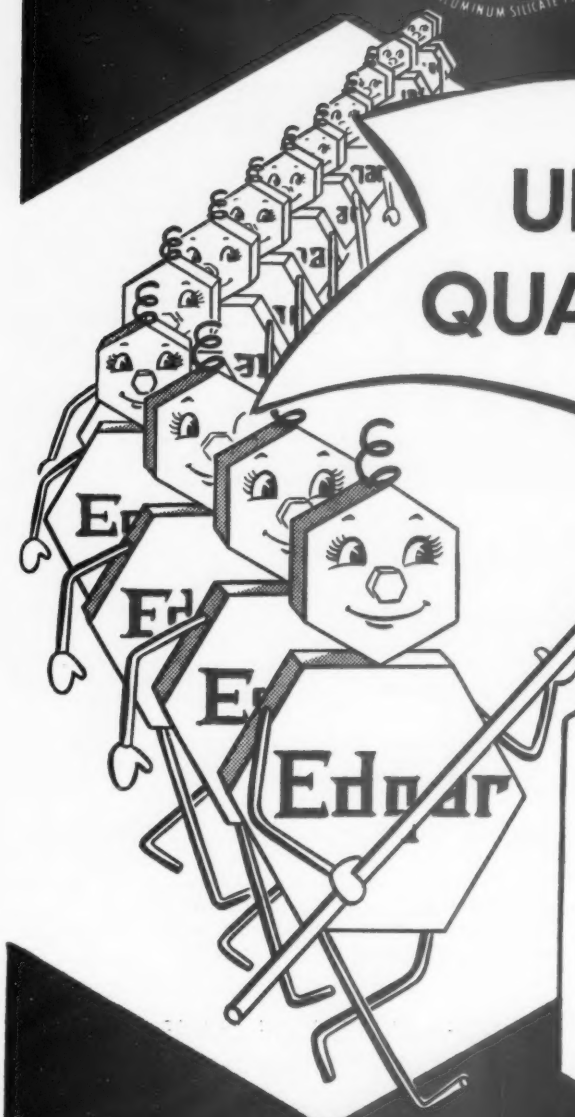


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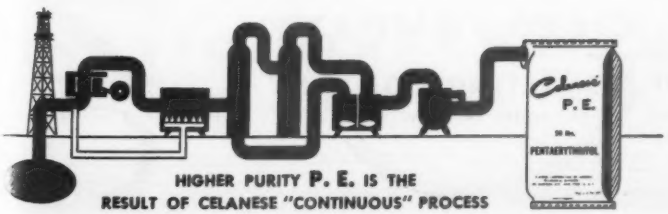


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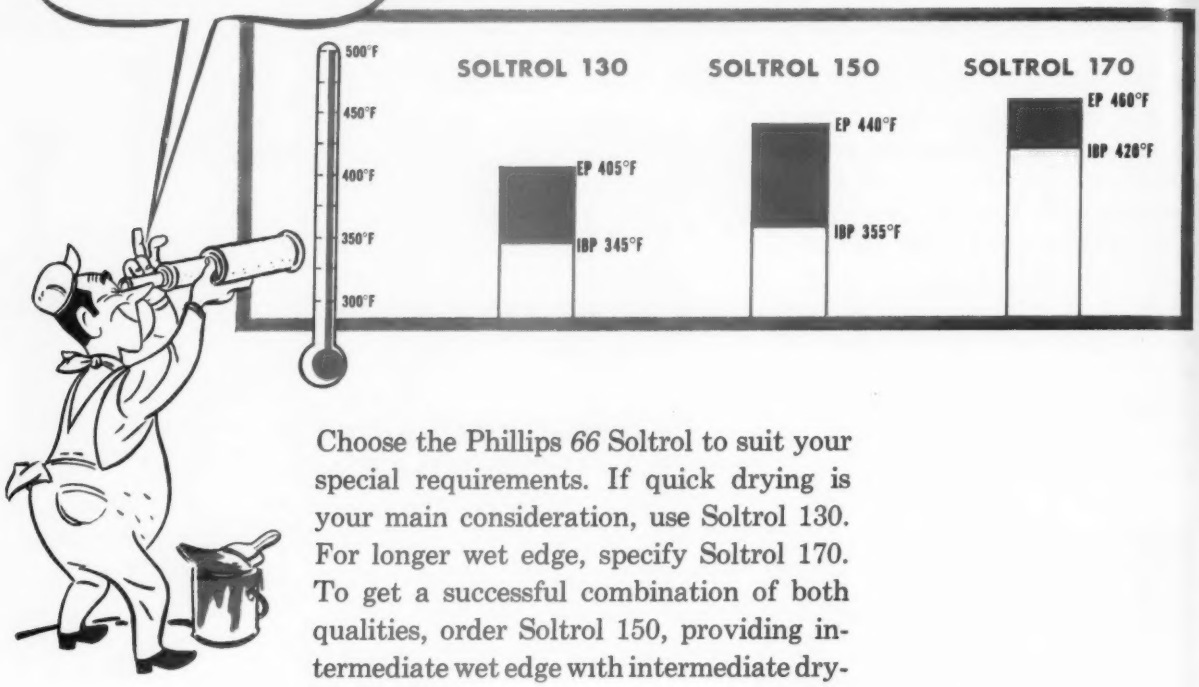


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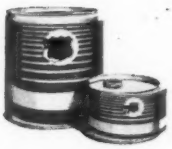

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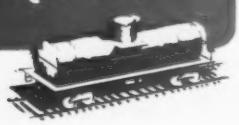

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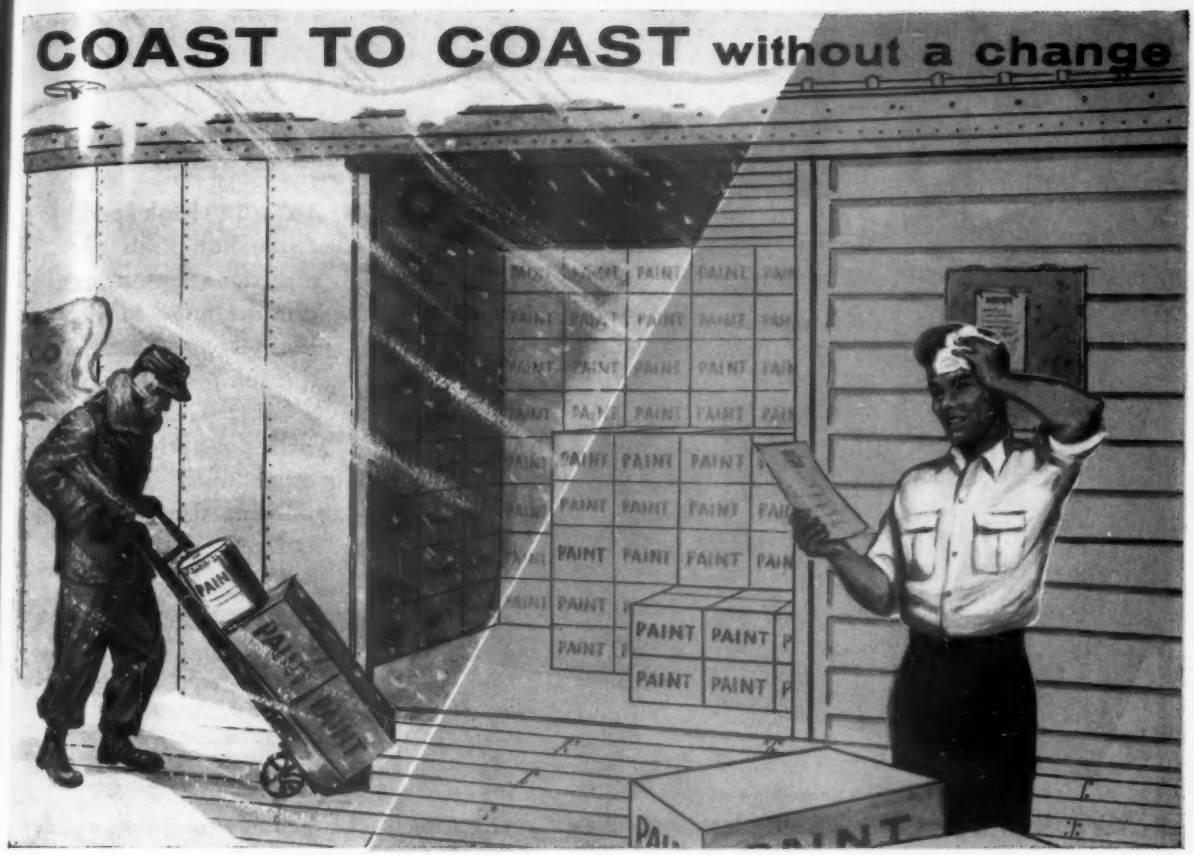


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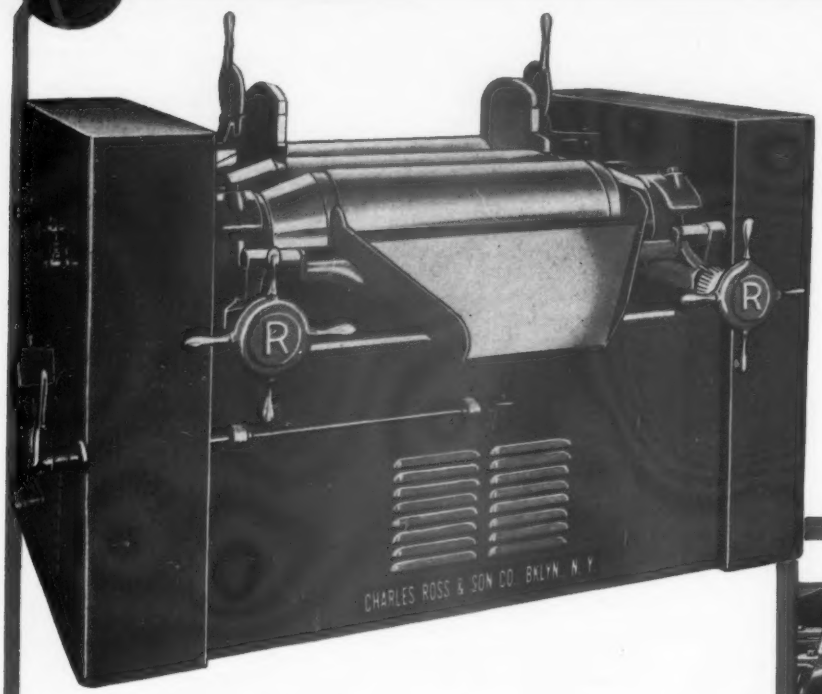


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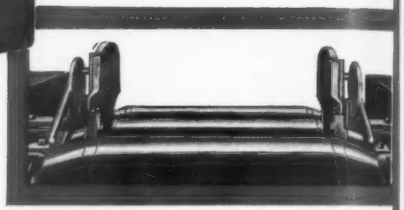

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# EXTERIOR PAINTS BASED ON ACRYLIC EMULSION

## *Report on Preliminary Outdoor Exposure*

MOST new products in the coatings industry appear first in formulations intended for interior use where service conditions are much less rigorous than they would be outside. Here the finish does not have to withstand as much of the blistering heat of the sun, it is not subjected to the battering of rain, sleet or hail, and it is usually well protected from the abrasive action of wind-driven sand and dust.

When a particular material proves unusually effective for interior coatings, however, the paint maker often begins to seek ways to adapt it for outside use. This is particularly true when the new material appears to offer, in addition to excellent service characteristics, greater ease of application and other desirable properties not previously available.

Rhoplex AC-33,* acrylic emulsion for coatings, has followed just this pattern of development. Originally introduced as a vehicle for water paints of the interior type, this particular emulsion has proved outstandingly effective in this application, according to the producer, and is now widely used in interior paints for both industrial maintenance and household use. As this development has been going on, however, many paint makers have also been quietly working with the product in formulations intended for exterior applications. Today a number of firms are manufacturing outside paints based on this acrylic resin and the coatings have been applied to hundreds of buildings. Thus, it now becomes possible to report on the development from a commercial point of view rather than just as a laboratory project.

Many of the film-formers used in the protective coatings field dry by oxidation. This can be a serious disadvantage, particularly in exterior paints, because oxidation can lead to embrittlement on aging. Rhoplex AC-33 is based on acrylic-type esters. These esters can be polymerized completely in emulsion form. When this point has been reached, no further polymerization occurs. Since this acrylic emulsion is completely polymerized prior to application, the resulting films are remarkably resistant to aging and to ultra-violet light.

Many outdoor tests are needed to establish durability of exterior coatings. Here glazed asbestos shingles are being examined for film defects after exposure in S. Florida climate.

Exterior coatings formulated with this emulsion have the following properties: ease of application, fast drying speed and quick recoating, excellent sealing properties, long film life, unexcelled color and color retention, high adhesion, smooth and uniform finish, water resistant, and minimum odor.

Another interesting property is the ease with which the brush or roller may be cleaned. When the painting job has been completed, the remaining coating is washed out with soap and water or by using a wetting agent. Brushes should, of course, not be allowed to dry out when loaded with paint. However, if this should occur by accident, the dried paint can usually be removed by the use of strong solvent type cleaners.

The user should wash out the brush with soap and water before starting his painting. This cleans the brush, supplies the water demand of the dry bristles and prevents undue viscosity build up.

### Properties of Acrylic Emulsion

A review of the basic properties of Rhoplex AC-33 provides a helpful background for the discussion of this new field of application.

The emulsion is supplied in the form of a milky white liquid with a solids content of about 46-47 per cent. It is a highly stable emul-

This report was prepared by the editorial staff of Paint and Varnish Production with the cooperation of the technical department of the Rohm & Haas Co.

‡Rohm & Haas Co.

View of outdoor test fence exposures with acrylic resin emulsion in Southern Florida.

sion, and can withstand repeated freeze-thaw cycles without loss of value as a paint vehicle. Since the acrylic esters from which the product is formed are completely polymerized in the emulsion form, the resin undergoes no molecular change after it is incorporated in a paint formulation—an important consideration in its use as a film forming medium.

The film produced by this acrylic emulsion is inherently tough and flexible, requiring no additional plasticizer which might migrate from the film and thereby cause failure. It exhibits excellent adhesion to most surfaces on which coatings may be applied, including asbestos shingles, masonry, and surfaces that have previously been painted with oil paints.

Chemically, Rhoplex AC-33 is highly inert. It is extremely resistant to coagulation by soluble salts and hence can be used with a wide variety of pigments. Ordinary tap water, even though it may contain a considerable quantity of dissolved salts, can be used for dilution of such paints without difficulty.

Specifications for Rhoplex AC-33 are as follows:

| | |
|---|---|
| Solids Content | 46 - 47% |
| ph | 9.0 - 9.5 |
| Appearance | Milky liquid |
| Weight per gallon | 8.5 - 8.8 |
| Specific gravity of solids | 1.09 |

**Preparation**

The manufacture of water-base paints from Rhoplex AC-33 is a simple operation. Mills such as a high speed mill or a pebble mill are most suitable. With some formulation adjustments, a roller mill can also be used.

Basically, the procedure is to make a pigment dispersion in water and Rhoplex AC-33. The dispersion is then mixed with the balance of the acrylic resin, the paint tinted to shade, pH adjusted with ammonium hydroxide to 9.0 and packaged. The exact procedure to follow depends somewhat on the equipment available but the following general instructions have been found helpful.

For ball mill grinds the entire formulation may be ground for the required number of hours and the pH then adjusted with ammonium hydroxide. For high speed or roller mill equipment the following procedure is suggested:

1. Charge a change-can mixer or pony with water, part of the Rhoplex AC-33, dispersing agents, preservative, thickeners, anti-foamer and other additives.
2. Add the required pigments in several small portions, extenders first, and mix all dry materials thoroughly before adding the next portion. For deep tones the colored pigments are also added at this time.
3. A minimum of 20-30 minutes mixing should be used to break down pigment flocculates as much as possible.
4. In roller mill production use a very loose setting of the rolls, approximately 0.0045 inch.
5. The dispersion produced can then be reduced by adding ammonium hydroxide and then the balance of the emulsion. The pH should be adjusted, if necessary, to 9.0 with additional ammonium hydroxide.
6. The paint is then tinted and packaged.

**Dispersants**

It is essential that an efficient dispersant be used in the production of pigmented systems. There are a number of suitable materials, among them Tamol 731-25%,* and the ammonium salt of Acrysol A-3*

Good pigment dispersion is essential in emulsion systems for best hiding power and application properties. The optimum amounts and types of dispersants should be determined for each pigmentation. A fluidity titration procedure has been devised for determining dispersing activity and the amount of dispersing agent to use in a particular system. In this procedure the pigments and extenders are dry blended in the same proportions as they will be used in the final formulation. Add just sufficient water to wet the pigments so that a stiff, slightly moist mass forms. Then add a solution of the dispersing agent in small increments, mixing well between additions. When the mass becomes fluid enough so that surface ripples disappear upon gentle shaking of the container, a fluid state has been attained, and the pigment is assumed to be saturated.

In practice, it has been found wise to add about 50% additional dispersant, since it is highly unlikely that simple agitation by hand is sufficient to wet all of the pigment and to break down all flocculates. The percent dispersant needed, by weight on pigment, is then calculated by using as a value one and one-half times the amount of dispersant required to attain fluidity.

Typical values obtained with Tamol 731 and a number of com-

*Rohm & Haas Co.

mon pigments are shown in Table I.

The amount of Tamol 731 should be kept to the minimum required to produce the desired fluidity in the final formulation since excessive quantities of dispersing agent may yield poorer dispersion. Addition of other electrolytes, of course, has the same effect. Excess dispersant also tends to reduce the water resistance of the finished coating. For maximum effectiveness Tamol 731 should be used in systems of pH 9.0—9.5. This, of course, is in the optimum range for most emulsion paint formulations.

Since Tamol 731 shows only slight activity in decreasing surface tension, a material such as Triton X-100* or Triton 770* should be included if wetting or emulsification properties are needed in the formulation.

In many formulations, particularly those containing anatase titanium dioxide, a 1:1 combination of Tamol 731 and the ammonium salt of Acrysol A-3 gives better dispersing action than Tamol 731 alone. Acrysol A-3 is polyacrylic acid supplied as a clear, colorless solution at 25% solids in water. A 10% solution of its ammonium salt is the most convenient form to use for dispersing pigments. This 10% solution is made as follows:

| | |
|---|---|
| Acrysol A-3 | 100 lbs. |
| Ammonium hydroxide (28%) | 25 |
| Water | 125 |

The 10% Acrysol A-3 solution above can then be combined with a 10% solution of Tamol 731 and used for the fluidity titration procedure and for production of dispersions.

Triton X-102 often can be used to advantage in reducing flocculation in pigment dispersions. About 0.5%, based on the dry pigment, is suggested for preliminary work. It should be added to the system before milling. Triton X-102 is not a dispersing agent so that normal quantities of Tamol 731 and Acrysol A-3 should be used.

**Viscosity Control Agents**

Two materials have proved particularly useful in increasing the viscosity in acrylic emulsion formulations. These are Acrysol GS* and carboxy methyl cellulose.

*Rohm & Haas Co.

**TABLE I - Fluidity Titrations With Tamol 731**

| | % Tamol 731 on Pigment | % Pigment Solids |
|---|---|---|
| Asbestine | 0.28 | 50 |
| Barium sulfate | 0.15 | 85 |
| Basic lead carbonate | 0.29 | 58 |
| Cadmium sulfide | 0.19 | 69 |
| Calcium carbonate | 0.05 | 71 |
| Calcium sulfate | 4.0 | 63 |
| Carbon black | 2.1 | 24 |
| Chrome oxide | 0.06 | 64 |
| Clay | 0.02 | 64 |
| Hansa yellow | 0.06 | 45 (1) |
| Toluidine red | 0.06 | 47 (2) |
| Iron oxide black | 0.22 | 56 |
| Titanium calcium pigment | 0.73 | 68 |
| Titanium dioxide (Non-chalking rutile) | 0.04 | 65 |
| Ultramarine blue | 0.56 | 67 |
| Raw umber | 0.90 | 50 |

(1) Contains 6% Triton 770 on pigment
(2) Contains 4% Triton 770 on pigment

It is reported that Acrysol GS is able to maintain a constant viscosity in a fluid system over a long period of storage under normal conditions. Many natural thickeners, of course, tend to hydrolyze and reduce in viscosity but Acrysol GS is said to be very resistant to such change. It is generally used in an emulsion formulation in the range of 0.1%—0.2% on total paint. Larger quantities generally give some reduction in water resistance of the finished coating.

Carboxy methyl cellulose has also proved very useful for increasing viscosity, particularly where maximum viscosity increase is desired. The 120-H grade made by *Hercules Powder Company* is particularly useful. In some formulations this material can best be employed at a 1½% to 5% solution in water. It is relatively soluble in hot water and may be added to the formulation to the extent of approximately 0.05%—0.075% as solids based on the total paint. The exact amount needed should be determined carefully for each formulation. With small additions, the viscosity of the system is increased greatly but a point is soon reached when additional amounts do not increase the viscosity a proportionate amount. Excessive quantities impair water resistance. A preservative should be used. These viscosity control agents should be added in the pigment grind rather than to the finished paint.

**Preservatives**

Modest amounts of preservatives should normally be used with all water systems because bacteria and mildew thrive on the organic matter which is introduced through the tap water added during the course of manufacture. Phenyl mercuric salts appear to be quite effective for this purpose and also help control mildew after application of the paint. Quantities in the range of 0.1%—0.6% are generally employed, based on the total paint. Rhoplex AC-33 itself may be safely stored without preservative, according to the manufacturer.

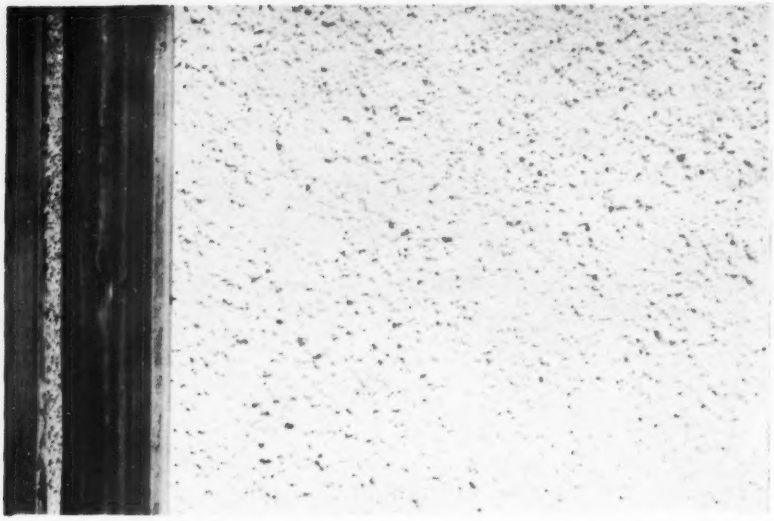
**Other Additives**

An anti-foaming agent should be used in these systems. Many good commercial materials are available. Generally these products should be added at concentrations of 0.1% based on the total paint. Each system should be investigated for efficiency in foam control since their action is quite specific.

Care, of course, should be taken not to introduce air into emulsion systems during paint manufacture. Free fall of liquids into mixing tanks or turbulent pumping of liquids should be avoided because once air is introduced into the system it is relatively difficult to remove.

Control of pH, of course, is important. Ammonium hydroxide is widely used for this purpose. The paint should be packaged at a pH level of approximately 9.0. Determination of pH can be made with Hydrion pH paper (range 9.0—10.0) available from laboratory supply houses, or with a Beckman pH meter.

In general Rhoplex AC-33 systems dry rapidly. No difficulty is encountered in applying a second



Close-up of a very rough stucco surface. Such surfaces can be painted successfully with paints based on acrylic emulsion due to their excellent hold-out, flexibility and ease of spreading.

coat but this necessarily means that wet edge retention is relatively low. Normally this is not a problem because the paint does not pick up or roll up during application. However, if greater wet edge retention is considered desirable, carboxy methyl cellulose, as discussed above, is quite helpful. Similar results can be obtained with a 3:1 mix of tributyl phosphate and pine oil. This combination should be added to the finished paint at a concentration of 3% on total water in formulation.

**Pigmentation**

There are many types of pigments which are quite satisfactory for the formulation of emulsion paints. Among these are the following:

| | |
|---|---|
| *Titanium dioxide* | *Phthalocyanine and ultramarine blue* |
| *Lithopone* | *Red, brown, and black iron oxides* |
| *Mica* | *Toluidine red* |
| *Barytes* | *Hansa yellow* |
| *Silica* | *Napthol red* |
| *Clay* | *Phthalocyanine green* |
| *Calcium carbonate* | |
| *Asbestos* | |
| *Chrome oxide* | |

Pigments used in emulsion coatings must have high alkali resistance not only because the coating system is alkaline, but because the coatings are often applied over highly alkaline concrete and stucco. Some pigments show better exterior durability than others and this factor should be kept in mind in making a selection.

It is reported that Rhoplex AC-33 has high tolerance for metallic ions so that it is stable even in the presence of calcium sulfate. Pigments of this type, however, tend to reduce the freeze-thaw stability of the paint; this should be carefully considered in the selection of pigments.

**Application**

Paints made with Rhoplex AC-33 can be applied to a variety of exterior surfaces such as asbestos shingles, cinder block, stucco, brick, cement and previously painted wood siding. As in any exterior painting application, certain precautions should be taken if best results are to be obtained.

Most glazed asbestos shingles can be painted without difficulty although some types of new shingles may be difficult to wet. If such shingles are allowed to weather for a few months, they can normally be painted readily.

The water demand of porous surfaces such as bare cinder blocks, stucco or cement surfaces may be very high. In these cases, the painter should be instructed to add water to the paint and adjust the viscosity to the absorbency of the surface. Sometimes a quart or more of water per gallon of paint will be needed. This will prevent unduly fast setting times and will give improved flow and leveling properties.

Loose scale should be removed before application. Old whitewash, casein, cement paints or other water sensitive materials with poor adhesion and high dusting properties also should be removed to avoid subsequent flaking or peeling difficulties. Adhesion to previous coats of weathered oil paints is good but the surfaces should, of course, be dusted to remove loose chalk.

Previously painted wood siding may be painted very successfully with exterior paints based on Rhoplex AC-33. Good adhesion is shown to weathered painted wood. Nail holes should be puttied and covered with a coat of shellac to prevent possible rust bleeding.

With white or light-colored paints, there is danger of color bleed from cedar or redwood siding during application unless the siding has been previously painted with oil paints. This is due to water soluble colored materials in woods of this type.

Paints made with Rhoplex AC-33 are said to dry very rapidly. As soon as the water in the film has evaporated, a second coat can be applied. This makes it possible to apply the second coat without moving the scaffolding, thus reducing painting costs.

Paints may be applied by brush, roller coat or spray gun. Since the paints brush easily, brushes four to six inches wide may be used. Tapered nylon brushes are among the most satisfactory for this purpose. They retain their fiber stiffness due to high water resistance and yet permit uniform coverage and freedom from lap marks. Another advantage is that nylon brushes are easier to clean since the paints do not penetrate the filaments appreciably. It is important to wet the brush or roller with water before painting to satisfy the water demand.

Rollers can be used very satisfactorily with these paints. Generally, the dip type are preferred to the fountain type as they are lighter, easier to clean and create less foam during application. Long nap rollers are available for use on rough cement, brick or stucco surfaces.

For spray application the paints may be used at approximately the same viscosity as for brushing or can be reduced with water if desired. External mix spray guns

Apartment building in Southern California is coated with an acrylic emulsion paint These paints are said to be very resistant to alkali.

Deep tone acrylic emulsion paints used on this home in Southern Calif show no water spots, also are free from streaking and flooding.

Home in Philadelphia area was coated with acrylic emulsion paint on wood and stucco. Paint has held up very well for over 1 year.

should be used at 35 - 40 pounds line pressure. Bleeder type guns with low pressure air are not satisfactory due to clogging.

In all exterior applications avoid brushing out or applying the paint in too thin a coat. Since the paints go on very easily, excessively thin coats can be applied which, of course, will give reduced hiding and durability. Spreading rate should range from 300 to 500 square feet per gallon depending on the surface type, its roughness, water demand and previous treatment.

Generally, exterior paints made with this acrylic emulsion should be applied under reasonably good weather conditions although dampness and high humidity conditions do not interfere with application. However, there is a definite minimum temperature of application for each specific formulation and for each surface coated. Some formulations can be applied to non-porous surfaces at temperatures as low as 50° F. or even 35° F. without serious difficulty. Other formulations may require higher temperatures such as 60°F. for successful application. Porous surfaces tend to cause more difficulty in film formation than non-porous surfaces at low application temperatures. Consequently, each formulation should be checked over various surfaces to determine the minimum temperature at which it can be applied.

**Exterior Exposure**

A series of outdoor exposures have been conducted to determine the formulation and application factors that influence the exterior performance of paints made with Rhoplex AC-33. A number of different paints have been tested on asbestos shingles, stucco, yellow pine, and cedar.

Paints have been exposed at various locations including Eastern Pennsylvania, Long Island, Delaware, Florida, California and Arizona. The following factors have been evaluated on many of these paints:

| *Factor* | *Method of Test* |
|---|---|
| Chalking | ASTM D659-44 |
| Erosion | ASTM D662-44 |
| Flaking | ASTM D772-47 |
| Checking | ASTM D660-44 |
| Cracking | ASTM D661-44 |
| Whiteness | Photovolt K value |
| Mildew | Visual rating |
| Dirt pickup | Visual rating |
| Wood and iron staining | Visual rating |

Paints were applied by brush at a spreading rate of 450 square feet per gallon. The amount of paint applied was determined by weighing the paint can and brush before and after painting. Two coats of the same paint were applied to the unpainted panels in all cases.

Some of these exposure tests have now been in progress for two years. Others have been observed for six months to a year thus far. Exposure results have been extremely encouraging both on masonry and on wood. This progress report is the first in a series of reports that will be made available as additional exposure experience is gained.

**Factors Affecting Performance**

All of the factors involved in preparing the most durable outside coating with Rhoplex AC-33 are not yet known. However, a number of preliminary conclusions can already be drawn from the exposure work to date. These are summarized

(1) The types and amounts of pigment used with Rhoplex AC-33 have a profound effect on chalking rate.

(2) Pigment volume concentrations ranging from 20% to 50% are being tested. Best all around results are being obtained at the 30% - 40% pigment volume content level. A pigment volume content of 20% gave excessive dirt collection with non-chalking rutile pigment but undoubtedly a ratio of non-chalking to chalking type pigment could be found to give good panel clean-up. At 20% pigment volume content paints have considerable sheen.

(3) The type and amount of titanium dioxide used has an important effect. At present a titanium dioxide mixture consisting chiefly of chalk-resistant rutile titanium dioxide with the balance free or semi-chalking anatase appears optimum. A 50:50 mixture chalks somewhat too heavily for best durability at high pigment volume contents. Straight non-chalking rutile titanium has not chalked fast enough at 20% - 30% pigment volume content to maintain a clean surface so the optimum ratio lies between these extremes.

(4) The optimum quantity of titanium dioxide at present appears to be about 2½ - 2¾ pounds per gallon of paint.

(5) Thus far the type of ex-

TABLE II - Typical Exposure Formulations Made With Rhoplex AC-33

| Material (Pounds per 100 Gallons) | Exterior Formulation Number | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 5 | 7 | 10 | 14 | 15 | 18 | 23 | 26 | 27 | 28 |
| Titanium dioxide (Free-chalking anatase) | 200.0 | | 100.0 | 94.3 | 97.3 | 112.5 | 87.5 | | | |
| Titanium dioxide (Non-chalking rutile) | | 200.0 | 100.0 | 94.3 | 97.3 | 112.5 | 87.5 | 40.0 | 60.0 | 80.0 |
| Titanium dioxide (Chalk-resistant anatase) | | | | | | | | 160.0 | 140.0 | 120.0 |
| Talc | 181.7 | 189.5 | 185.5 | | | 251.5 | | 185.6 | 185.6 | 185.6 |
| Water ground mica | | | | 174.0 | | | | | | |
| Diatomaceous silica | | | | | 162.0 | | | | | |
| Calcium carbonate | | | | | | | 359.0 | | | |
| Tributyl phosphate | 9.0 | 9.0 | 9.0 | 8.5 | 8.8 | 9.0 | 9.0 | 9.0 | 9.0 | 9.0 |
| Pine oil | 3.0 | 3.0 | 3.0 | 2.8 | 2.9 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Antifoamer | 2.3 | 2.3 | 2.3 | 2.2 | 2.1 | 2.3 | 2.3 | 2.3 | 2.3 | 2.3 |
| Boric acid | 6.8 | 6.8 | 6.8 | 6.4 | 6.4 | 7.1 | 7.1 | 6.8 | 6.8 | 6.8 |
| 50/50 Acrysol A-3/Tamol 731 (10% solution) | 12.5 | 18.8 | 12.5 | 35.4 | 12.2 | 16.7 | 14.6 | 12.5 | 12.5 | 12.5 |
| Preservative | - | 5.7 | 5.7 | 5.4 | 5.4 | 5.9 | 5.9 | 5.7 | 5.7 | 5.7 |
| Rhoplex AC-33 (46% solids) | 637.5 | 631.9 | 634.1 | 600.0 | 623.0 | 513.6 | 415.0 | 634.1 | 634.1 | 634.1 |
| Water | 53.7 | 48.0 | 50.1 | 92.3 | 60.2 | 131.0 | 177.0 | 50.1 | 50.1 | 50.1 |
| Ammonium hydroxide (28%) | 20.3 | 20.4 | 20.4 | 19.3 | 19.2 | 21.3 | 21.3 | 20.4 | 20.4 | 20.4 |
| Totals | 1126.8 | 1134.4 | 1129.4 | 1134.9 | 1096.8 | 1175.8 | 1189.2 | 1129.5 | 1129.5 | 1129.5 |
| **Property** | | | | | | | | | | |
| Pigment volume content (%) | 30 | 30 | 30 | 30 | 30 | 40 | 50 | 30 | 30 | 30 |
| Total solids (%) | 59.9 | 60.0 | 60.0 | 56.2 | 58.8 | 60.4 | 56.7 | 60 | 60 | 60 |

tender does not appear to have too much effect on film durability.

(6) A mildewicide should be added to all formulations. Use of zinc oxide in the system reduces mildew.

(7) Leaded zinc oxide gives less chalking than zinc oxide but the place for lead and zinc pigments has not yet been clearly defined.

(8) Wood staining is likely to occur during application with redwood and cedar siding.

(9) Paints based on Rhoplex AC-33 are quite permeable to moisture vapor and show very high resistance to blistering in blister box tests. This may be one of the most important properties of these paints due to the tighter construction of modern houses and the increasing number of blistering difficulties reported for oil systems.

(10) Color retention and whiteness are excellent. However, the type of titanium dioxide has a considerable effect on color retention.

There are a great many variables in outdoor testing, some of which can be controlled such as exposure location, film thickness, formulation, material painted and application conditions. Others are beyond the control of the paint chemist such as weather conditions and previous treatment of surfaces. Consequently, a vast body of outdoor experience must be built up before valid generalized formulations can be recommended.

The formulations in this report are currently under test but do not represent the best formulations that can be designed. However, they are presented in Table II as typical formulations under test. Preliminary exposure results are now available on these paints at several geographic locations and over several surfaces.

Most of the exterior formulations given in Table II require either little or no addition of water in the formulation during manufacture. In case the particular formulation under test does not contain sufficient water to make a fluid pigment dispersion, part of the Rhoplex AC-33 should be added. Such dispersions can be handled readily on a high speed mill or pebble mill but may be difficult to grind on a roller mill.

The paints listed in Table II (as well as a number of others) were brushed in two coats at 450 square feet per gallon each on new glazed asbestos shingles, yellow pine and red cedar siding. Exposure tests are being conducted both in Florida and Eastern Pennsylvania. Test panels were placed vertically, face north and south. To simplify the data presented, only the test results on panels facing south are reported since most failures will normally occur first on this exposure. Exposure results are given in Table III.

There were no indications of erosion, flaking, checking, or cracking on any of these panels. There were traces of blisters on asbestos shingles with Paints 10, 14 and 15. Staining to a degree was present on all paints over red cedar. As can be seen, Paint 5, with free chalking anatase titanium dioxide, exhibited excessive chalking and Paint 7, with non-chalking rutile, gave little or no chalking. The other formulations with mixed titanium pigments gave more reasonable chalking rates but may still be somewhat too free-chalking. Dirt collection was rather heavy on Paint 7.

The same paints given in Table II were exposed in Florida for nine months on the same types of panels used for the Pennsylvania exposures. Results are tabulated in Table IV.

The results reported in Table IV show some interesting trends. Chalking rate on all of the paints tested is somewhat too high with the exception of Paint 7 made with straight non-chalking rutile titanium dioxide. Paint 27 made with

TABLE III - Outdoor Exposure Data on Paints Made With Rhoplex AC-33
South Vertical Exposure for Six and Nine Months in Eastern Pennsylvania

| Paint Number[1] | Chalking[2] Composite rating on Pine, Cedar, Asbestos | | Original Whiteness (K value)[3] | Whiteness After Six Months Exposure (K value)[4] | |
|---|---|---|---|---|---|
| | Six Months | Nine Months | Pine, Cedar, Asbestos | Pine, Cedar | Asbestos |
| 5 | 6 | 4 | 0.00 | 11.75 | 6.21 |
| 7 | 10 | 9-10 | 2.40 | 11.90 | 15.60 |
| 10 | 9 | 9+ | 3.30 | 11.90 | 13.20 |
| 14 | 9 | 9 | 8.20 | 15.00 | 12.90 |
| 15 | 9 | 9+ | 7.05 | 15.90 | 11.89 |
| 18 | 9 | 9- | 6.85 | 12.22 | 10.70 |
| 23 | 9+ | 9 | 3.70 | 11.90 | 9.65 |

[1]Paints 26, 27, 28 in Florida only
[2]Chalking Scale - 10 - No chalking
1 - Heavy chalking
[3]Low K values mean whitest films
[4]Little change in nine months

a 30:70 rutile: semi-chalking anatase showed a more reasonable chalking rate but still chalked too fast. A higher ratio of non-chalking rutile pigment would be desirable. The type of extender has not affected the results to any great degree.

The pine panels checked in most cases and caused the paints to crack. Only one of the cedar panels checked. No cracking occurred on the other cedar panels or on the asbestos panels. Considerable erosion was noted on the faster chalking formulation on pine panels. Dirt collection was absent on most of the asbestos panels but occurred on pine and cedar at a rate roughly in inverse proportion to the rate of chalking. Some mildew was noted on all of the wood panels but only on two of the asbestos panels. It is apparent that the substrate influences to a degree the tendency for mildew to form.

These panels had been exposed to some 30 inches of rainfall in the eight weeks prior to these observations. Mildew forms rapidly under these hot, moist conditions on almost any surface. Slight cedar staining was noted on most of the red cedar panels in earlier observations.

The formulations given in Table V are suggested for the study of exterior paints based on Rhoplex AC-33. Only very limited exposure experience has been obtained on paints of this type but our preliminary studies indicate that good durability should be obtained. These formulations are suggested for laboratory study and should not be considered final formulations for commercial products.

A pony mixer or change can mixer should be used for the premix. Ingredients should be added in the order shown. Make sure that each ingredient is thoroughly incorporated before adding the next item. The completed premix should be given one pass over a loose roller mill or put through a high speed mill. The balance of the Rhoplex AC-33 should be added using slow speed agitation. The pH should then be adjusted to 9.0 with 28% ammonium hydroxide.

The ammonium salt of Acrysol A-3 is made as follows:

| | |
|---|---|
| Acrysol A-3 | 100 lbs. |
| Ammonium hydroxide (28%) | 25 lbs. |
| Water | 125 lbs. |

As this is written at least thirty firms are known to be manufacturing such paint commercially and the list is growing steadily. These paints have been used on buildings in many parts of the country, from East to West, in both northern and southern climates, and over many different types of surfaces. Some structures have been painted under carefully controlled conditions with the work supervised by laboratory technicains. Many more have been painted in the course of regular work by contractors and home owners.

None of the commercial applications, it must be admitted, is yet very old. Rhoplex AC-33 itself has not been available for as long a period as most paint jobs are expected to last, and the commercial paints based on it are naturally even more recent developments. Paint manufacturers —and more especially, paint chemists—hesitate to make claims or forecasts until full information is at hand, and that can come only with time. Accelerated tests in laboratories can never supply the complete picture of how a paint will perform under the widely varying conditions of actual use. In spite of their traditional caution, however, it is evident that paint makers view the new development in paint making with high degree of confidence.

The evidence, growing more impressive with each passing month, indicates that a major change in the paint industry is at hand.

TABLE IV - Outdoor Exposure Data on Paints Made With Rhoplex AC-33

South Vertical Exposure for Nine Months in Southern Florida

| Paint Number | Chalking | | | Cracking[1] | | | Erosion | | | Dirt Collection | | | Mildew | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Pine | Cedar | Asbestos | Pine | Cedar | Asbestos | Pine | Cedar | Asbestos | Pine | Cedar | Asbestos | Pine | Cedar | Asbestos |
| 5 | 3 | 4 | 2 | 7 | 8 | 10 | 5 | 7 | 10 | 9 | 9 | 10 | 8 | 8 | 9 |
| 7 | 9 | 9 | 9 | 9 | 10 | 10 | 9 | 10 | 10 | 6 | 8 | 8 | 7 | 9 | 8 |
| 10 | 6 | 4 | 2 | 9 | 10 | 10 | 9 | 10 | 10 | 8 | 9 | 10 | 8 | 9 | 10 |
| 14 | 6 | 4 | 4 | 10 | 10 | 10 | 8 | 10 | 10 | 9 | 8 | 10 | 9 | 9 | 10 |
| 15 | 7 | 5 | 4 | 8 | 10 | 10 | 8 | 9 | 10 | 6 | 7 | 10 | 6 | 6 | 10 |
| 18 | 4 | 3 | 3 | 8 | 10 | 10 | 6 | 10 | 10 | 9 | 9 | 10 | 9 | 8 | 10 |
| 23 | 8 | 6 | 4 | 8 | 10 | 10 | 8 | 10 | 10 | 8 | 9 | 10 | 9 | 9 | 10 |
| 26 | 8 | 6 | 5 | 8 | 10 | 10 | 10 | 10 | 10 | 8 | 8 | 9 | 8 | 9 | 10 |
| 27 | 8 | 6 | 5 | 9 | 10 | 10 | 10 | 10 | 10 | 8 | 8 | 10 | 8 | 9 | 10 |
| 28 | 8 | 5 | 5 | 9 | 10 | 10 | 8 | 10 | 10 | 8 | 8 | 10 | 8 | 9 | 10 |

[1]Cracking due to checking of wooden panels. No indication of cracking or peeling on any panels.

Table V. Test formulations for exterior paint based on Rhoplex AC-33.

| Premix In Following Order | 100 Gallon Formulations Formulation A Pounds | Formulation B Pounds |
|---|---|---|
| Water | 50.8 | 50.8 |
| Tamol 731 (10% solution) | 9.0 | 6.0 |
| Acrysol A-3 (10% ammonium salt) | 9.0 | 6.0 |
| Nopco 1497V | 2.2 | 2.2 |
| Butrol | 1.1 | 1.1 |
| Super Ad-It | 5.5 | 5.5 |
| Pine Oil | 3.0 | 3.0 |
| Tributyl phosphate | 9.0 | 9.0 |
| Rhoplex AC-33 (46% solids) | 85.0 | 85.0 |
| Barytes | 40.6 | 40.6 |
| Diatomaceous silica | 75.0 | 75.0 |
| Titanium dioxide (semi-chalking anatase) | 75.0 | —— |
| Titanium dioxide (non-chalking rutile) | 200.0 | —— |
| Titanium dioxide (milk chalking rutile) | —— | 275.0 |
| *Add With Slow Mixing* | | |
| Rhoplex AC-33 (46%) | 578.6 | 578.6 |
| | 1143.8 | 1137.8 |
| Adjust pH with ammonium hydroxide to 9.0 | | |
| **Physical Constants** | | |
| Total solids | 61.8% | |
| Pigment volume content | 28% | |
| Approximate viscosity | 78 Krebs Units | |

# HOT SPRAY APPLICATION OF VINYL PAINTS

- ***MORE BUILD-UP PER COAT***
- ***LOWER LABOR SAGGING***
- ***REDUCES COSTS***

By B. C. Wright*

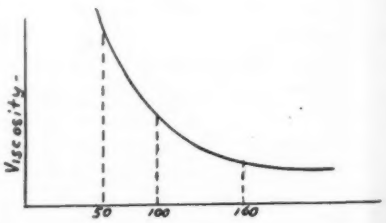
ONE of the most promising new weapons in the fight against corrosion is the vinyl based paints. It has been proven that they have excellent resistance to more different corrosive exposures than any other air dried paint, particularly if the system is built up to the thickness of five thousandths of an inch. Vinyls are not easily brushed on, nor do they work easily in the spray gun unless quantities of thinners are used. These facts add up to the greatest drawback in the use of vinyls—the numerous coats needed to build the system to the necessary thickness. Seeking to overcome this drawback and utilize the excellent protecting qualities of vinyls, Maintenance Engineers at *Carbide and Carbon Chemicals Company* in Texas City investigated different methods of spray painting. One of the methods they experimented with was that of hot spray application. It has proven highly successful. They found that by applying vinyls hot it is possible to obtain three mils per coat, to expand the field of spray application, to obtain a better job—all of this with less skilled spray painters and for a lower total cost.

*B. C. Wright is Maintenance Engineer of Carbide and Carbon Chemicals Co., Div. of Union Carbide and Carbon Corp., Texas City, Tex.

**Hot Application**

There has been considerable activity since World War II in the hot application of lacquers, automotive enamels, and product finishing. But as far as could be learned, no hot spraying had been done with vinyl paints on maintenance and construction work previous to their testing in Carbide's Texas City Plant.

As in any viscous fluid the viscosity of vinyl paint is lowered as its temperature is increased. For some elevated temperature the ratio of viscosity change to temperature change becomes very small. It therefore follows that if the vinyl paint is heated and sprayed in that temperature range the actual spraying viscosity is constant regardless of ambient temperatures. With a hot spray application the atomization air pressure, the paint pot pressure and the gun adjustments can remain constant throughout the day and seasons. Further, no thinning is required, thereby eliminating another "painters choice." In hot spray application, paint is delivered to the gun at approximately 160 degrees F. This temperature causes the immediate evaporation of much of the solvents, and this solvent evaporation depresses the temperature of the paint so that the actual temperature of the paint when striking the surface is ambient or slightly above. This solvent release increases the viscosity of the vinyl paint enabling much greater film thickness without sag.




Temperature F

Typical curve for paint in system "A"

The first heater purchased was a portable, electrically-heated, noncirculating unit originally designed for application of automotive enamels. This heater was placed in the paint line between the paint pot and the gun and was strapped to the spray man. It is an *Underwriters' Laboratories* listed device of light, rugged construction, insulated, and equipped with a factory set thermostat adjusted to 160 degrees F. This setting has proven ideal for vinyl paints.

**Evaluation**

Preliminary evaluations consisted of spraying one set of sandblasted

**TABLE NO. 1**

**Averages of numerous checks on film thickness of vinyl paints applied cold versus hot.**

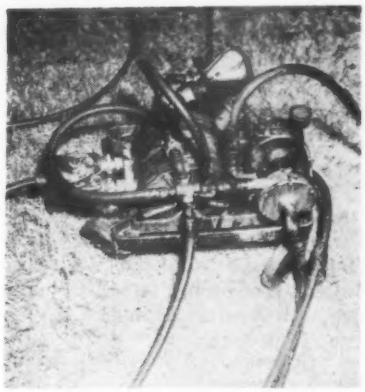
(All measurements approximate)

| System | Coat No. | Thickness in Mils | | Increase in Mils | Percent Increase |
|---|---|---|---|---|---|
| | | Applied Cold | Applied Hot | | |
| A | 1 | 1+ | 1½− | ¼ | 20 |
| | 2 | 2½− | 4½+ | 2½ | 90 |
| | 3 | 1½ | 4 | 2½ | 160 |
| | TOTAL | 5 | 10 | 5¼ | 100 |
| B | 1 | 1+ | 1½− | ¼ | 20 |
| | 2 | ½− | 1½+ | 1¼ | 250 |
| | 3 | 1½ | 1½ | 0 | 0 |
| | 4 | 1 | 1½ | ½ | 50 |
| | TOTAL | 4 | 6 | 2 | 50 |
| C | 1 | 1½− | 1½+ | ¼ | 15 |
| | 2 | 1½+ | 2− | ¼ | 15 |
| | 3 | 3 | 4 | 1 | 30 |
| | TOTAL | 6 | 7½ | 1½ | 25 |

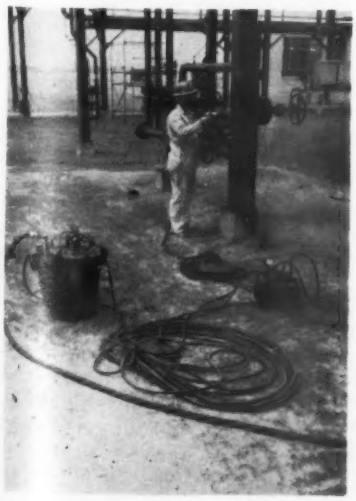
barrels and two KTA type** panels by conventional methods, and another set using hot spray with each of three vinyl systems then in use at our plant. A highly skilled spray man shot each coat, and though the film thicknesses with the cold application were greater than can be expected in the field, we have found that the hot applied thicknesses are typical of field jobs. Film thicknesses were checked after each coat and may be found in Table 1. It will be noticed that with each system there was a very small gain in the hot application of the primer over the conventional application. It is of interest that in paint "B" the two mil gain in total thickness occurred mostly in the second coat. Also, in each of these systems one or more coats were eliminated from the total number recommended by the manufacturer. This was due to the exceptional build obtained by the skilled spray man. Film continuity was checked electrically after each coat and in every case was found to be superior with hot spray. Visual inspection by naked eye and under magnification indicated the superiority of the hot application and it had more gloss and had flowed out better.

Six barrels were placed on a rack one foot over high tide on the shore of Galveston Bay, and one hot sprayed and one cold sprayed KTA type panel from each vinyl system A, B, and C was exposed at our two most corrosive plant locations. Frequent inspections have proven that we obtained an excellent coating on all six systems, but in every individual detail the hot spray system appeared better than the cold spray. Numerous checks for adhesion have shown that hot spray definitely adheres better.

**KTA-Kenneth Tator Associates, panels described in *Chemical Engineering*, December 1952.



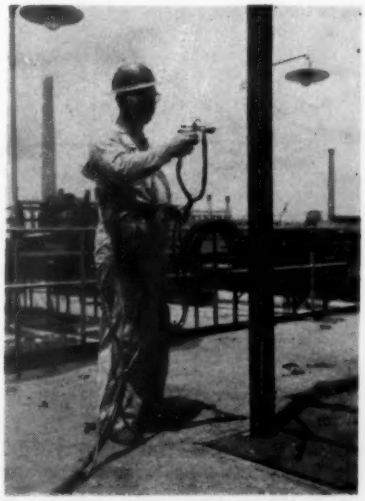
One view of the circulating type heater and the various lines for air, paint, and power.



View of equipment used to hot spray vinyl resin paints with a circulating type spray unit. This unit allows paint to circulate past the gun and thru heater when the gun is not spraying, resulting in a more uniform paint temp. at gun.

### Field Tests

On the basis of these tests it was decided to apply system "A" by hot spray on a small unit pipe rack consisting of about 3900 square feet of surface. Conventional spray equipment was used throughout with the single exception of the heater element which was placed in the paint line. It was found that 20 psi pot pressures, and 50 psi atomization pressure



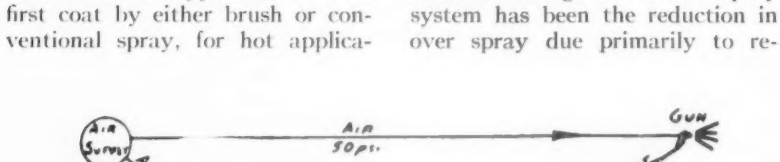
This is the equipment needed for the non-circulating type heater. The heater is strapped to the painter and its thermostat is adjusted to 160 deg. F., ideal setting for vinyl paints. Unit has been in daily use for almost a year.

produced the best results. The gun was opened wide and the painter was instructed to apply the paint in a single continuous pass until the surface looked wet. It was unnecessary to thin the paint. A minimum film thickness of three mils per coat was obtained on the second and third coats with the average thickness close to 3½ mils. Further, this average was very consistent. Total film thickness for the three coats ranged from 7½ to 9 mils with 8½ mils the approximate average. Checks were made for adhesion and continuity and these checks confirmed the excellent promise that hot spray of vinyls had shown on preliminary testing. With respect to costs, even on this job, it was found that the total labor cost was approximately 20 per cent less than a similar job using a conventional five coat system. Paint coverages on coats two and three were approximately 90 sq. ft. per gallon.

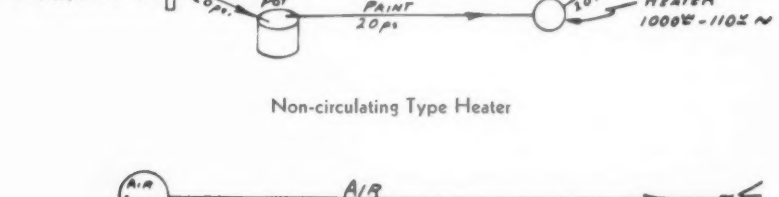
Paint specifications at this plant since the first pipe rack job, have called for the application of the first coat by either brush or conventional spray, for hot application of the first coat was considered unnecessary. The remainder of the specifications call for second and third coats to consist of system "A" applied hot.

On subsequent jobs we have increased the speed of application and have realized film thicknesses from three to four mils and labor cost reductions of approximately thirty per cent. An important extra advantage of the hot spray system has been the reduction in over spray due primarily to reduced pot pressure. What little over spray there is, is dry, which means that hot spray can be used in many places where conventional spray would not be possible due to paint drifting and settling on other surfaces. Direct spray may be brushed off at a distance of from four to eight feet, because during travel it becomes too dry to adhere.

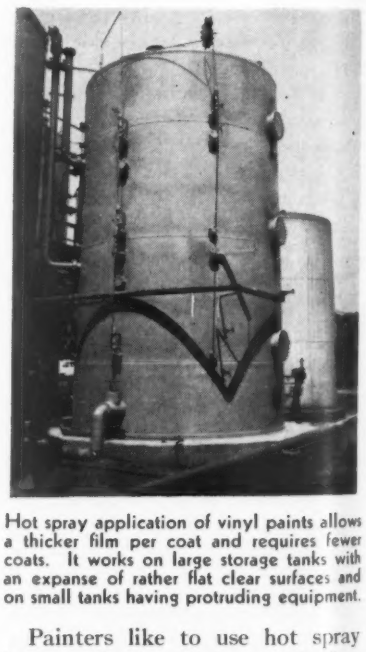
This is the set-up of the lines and gun when a circulating type heater is used. The line at the left is for air, the center one carries hot paint to the gun, and line at right returns unused paint to paint pump. Note gun is held at 90° angle to equipment being sprayed.




Non-circulating Type Heater




Circulating Type Heater



Hot spray application of vinyl paints allows a thicker film per coat and requires fewer coats. It works on large storage tanks with an expanse of rather flat clear surfaces and on small tanks having protruding equipment.

Painters like to use hot spray because it is cleaner and they believe there is less health hazard than with the fog that occurs with conventional spray. Also, they like hot spray because it appears that anyone can become an expert with it. No thinning is required and no sags occur. They just

(*Turn to page 82*)

# GOT A PROBLEM?

## YOUR SUPPLIERS' TECH SERVICE CAN HELP YOU

CUSTOMER'S PA. via long distance, to a lacquer manufacturer:

"Where's that shipment of LL 201 lacquer due here today? The paint shop is on my neck!"

"Sorry," sighs the lacquer man, "I'll look into it and call you back."

He hangs up . . . calls his production manager.

"Joe, what's holding up that LL 201 for Smith & Company? They're screaming for it!"

"Having trouble with hazing," Joe explains.

"Better track it down in a hurry," warns the boss, "or we may lose the sale. And, Joe . . . maybe one of our suppliers can help."

The boss phones back to his customer, explains about the hazing, and promises action.

"Please, get it to us soon," replies the customer, "or I may have to shop around, much as I hate to, even if I have to pay a few cents more."

"Give me a couple of days," says the lacquer man. Maybe you won't have to pay a few cents more."

Meanwhile, the production manager calls the sales representative of one of his chemical suppliers.

"Can you help? We've got to act fast and we can't up the cost. Sorry to hand you a problem like this on such short notice."

"Thanks for calling," replies the sales representative, "What formulation are you using?"

The chemical salesman turned the problem over to his company's technical service laboratory. Next day their lacquer chemist was able to report the cause and suggest a remedy:

*Cause*:

Hazing due to incompatibility between the ketones in the solvent and the alkyd resin.

*Remedy*:

Of several possible methods, the one recommended by the lacquer chemist . . . for performance plus economy . . . was to reformulate the solvent portion. An ester such as propyl acetate (compatible with the alkyd resin used) plus a low-cost solvent blend, were recommended in place of the two ketones. The solvent blend contained methyl ethyl ketone, tetrahydrofuran, and acetals.

*Results*:

By making these substitutions, hazing was eliminated *and* the total cost of materials was reduced by one-half cent per pound. Lacquer manufacturer pleased: ships to customer by fast freight. Everybody happy.

It takes intensive work to produce such effective results so quickly.

The supplier's lacquer chemist and his assistants rejected a number of test lacquers before deciding on the best one. They sprayed each on panels, observing flow properties, drying time, presence or absence of performance defects such as pin-holing, poor adhesion, hazing, or blushing.

Tests finished, the completed panels were sent to the lacquer manufacturer for any additional tests he might want to make.

This is all fairly typical of hundreds of problems that chemical manufacturers are asked to solve every day. In this *actual* case, the supplier of lacquer ingredients was *Celanese Corporation of America*, manufacturing surface coating chemicals, solvents and intermediates . . . mostly petroleum-based.

The "before-and-after" table (Table I) provides the clearest exposition of how Celanese solved the foregoing problem by a process of substitution.

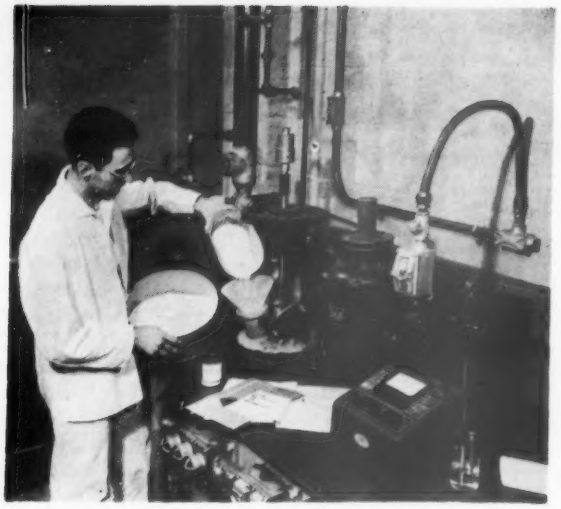
**Table I**

| | *Customer's Formula* | *Celanese' Recommended Formula* |
|---|---|---|
| Dry Nitrocellulose | 15% by weight | 15 |
| Alkyd Resin X | 14 | 14 |
| Dibutyl Phthalate | 3 | 3 |
| Blown Castor Oil | 4 | 4 |
| Titanium Dioxide | 10 | 10 |
| Methyl Isobutyl Ketone | 11 | — |
| Methyl Ethyl Ketone | 10 | — |
| Butyl Acetate | 11 | 8 |
| Propyl Acetate | — | 14 |
| Solvent blend* | — | 10 |
| Butyl Alcohol | 3 | 3 |
| Isopropyl Alcohol | 5 | 5 |
| Toluol | 14 | 14 |
| Cost/Pound ($) | .194 | .189 |

*Celanese Solvent 601

As indicated, the two pure ketones partly responsible for the hazing were omitted. Propyl acetate was added. So was the solvent blend described above, with the effect of reducing the proportion of ketone and making use of the retardant action of the other chemicals in the blend . . . a mixture with a somewhat flexible range of specifications.

The foregoing is an example of why the chemical supplier's technical service laboratory has grown to be a very important



Celanese lacquer technician charging resin kettle to make test batch of alkyd resin.

Setting up a laboratory jar mill to grind pigments—another step in pilot production at Celanese labs.

part of lacquer and paint component manufacture. Out of approximately 1,800 U.S. firms producing coatings today, about 150 large plants produce some 60% of the volume. The balance, an important 40% of the production, is handled by smaller firms.

These smaller surface coating manufacturers cannot, as a rule, afford a staff of specialists whose full-time job is formulation, reformulation, application research and testing. Yet such procedures are now of utmost importance, thanks to keen competition; new chemical components; the ever widening range of applications; and constant pressure for lower costs while maintaining quality. Chemical manufacturers with well-staffed, well-equipped surface coating laboratories offer their customers the benefit of a growing experience with a large variety of components, formulations and problems. Consequently, the manufacturer saves time, effort and money when he uses his supplier as consultant on troublesome technical problems.

True, most of the larger manufacturers maintain their own excellent laboratories. But it is to their advantage to have new ideas and new ingredients come to them pre-tested.

It also benefits their chemical supplier. For if the supplier's salesman, along with a new component or formulation can present the coating manufacturer with a technical report of tests already made, he is more certain of having his product tried. The manufacturer, briefed on what the product will do, can more easily decide whether and where it fits into his operation and his marketing objectives.

Compounding surface coatings is, of course, an empirical business because literally hundreds of chemicals are used in making paints and lacquers. Each individual coating may contain a dozen or more components, and the coating's performance depends both on individual characteristics of the components, and on reaction or compatibility within pairs or groups of components. Unlike a true chemical compound whose performance the chemist can often predict, the performance of a complicated mixture such as a lacquer can be only partly predicted.

And to add further complication, the conditions of end use or of manufacture can, and often do, cause trouble.

Consequently, the experienced eye of the surface coating

(*Turn to page 91*)

Spraying panels with lacquer being tested. Flow qualities are observed while spraying, and other important film properties as adhesion, flexibility, and defects (pinholing, hazing, etc.) are noted, when dry.

Standardizing a gloss meter preparatory to determining specular reflectance, or gloss, of a lacquer coating.

# CASEIN STABILIZERS FOR LATEX PAINTS

By HAROLD K. SALZBERG*

THE TERM "latex" in paint parlance will be used in this paper to denote the synthetic styrene-butadiene or plasticized styrene types of elastomer emulsion. These vehicle types were investigated early and latex paint formulations were first developed on them as the base. Information concerning stabilizers is almost exclusively limited to these types notwithstanding the more recent introduction into the paint field of polyvinyl acetate and acrylic emulsions. This discussion will perforce be confined to the styrene copolymer and straight styrene types of paint.

Stabilizing, applied to these products, denotes initially the employment of materials or procedures which provide resistance to separation in manufacture during storage, and in use. More broadly, stabilization embraces also the prevention or reduction in viscosity changes, prohibition of bacterial spoilage and checking color drift. Systems comprising pigment suspensions are stable by virtue of a fixed balance with respect to both chemical and physical forces. Therefore, time, temperature changes, and agitation, are the agencies to be considered as the primary adversaries of paints which initially are in perfect condition as they leave the factory.

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Oil-base paints, as distinguished from water-base paints, have long since been formulated to include ingredients which prevent undesirable changes, notably, viscosity increase and pigment sedimentation. In these systems the vehicle is a naturally stable solution of oils and oil-soluble resins in a solvent thinner, immune to separation by changes in temperature or by agitation over long periods of time. However, pigment sedimentation and hardening as well as livering tend to occur in the container, and these are the primary problems of stabilization which were attacked long ago in order to achieve high quality in oil-base paints.

The most significant change in departing from the oil-and-solvent vehicle is the replacement of the solvent with water, thus making the paint thinnable with water. Water is the carrier for the pigment binder in latex paints and this binder has the form of microscopic particles of resin which coalesce when applied as a film. It is the primary function of the stabilizer to prevent coalescence while the paint is in storage and while it is being applied. Also, this type of vehicle, being a dispersion of fine particles in water, is watery in consistency and by itself does not give body to the pigment slip to provide the desired covering properties of a paint as ordinarily brushed or sprayed on. The stabilizer firms up the vehicle and increases the viscosity of the paint. This two-fold requirement of a good paint is sometimes provided by the incorporation in the formula of two ingredients, a stabilizer proper and a thickener.

*Nature of Protein Stabilizers*

Protective shielding of the latex particles against coalescence in the paint is provided by materials of colloidal nature, which thus fall into the category of protective colloids. They are characterized by high molecular weight, and therefore high viscosity, good solubility in water, and ability to impart a charge to the resin particles so that they repel each other in the liquid paint.

Materials possessing these characteristics, are protein in nature, and among these casein and caseinates of varying grades have come into general use.

In a study of the pigmentation of latex paints Melsheimer and Hoback (7) refer to casein as the most frequently employed protective colloid in the formulation of latex paints.

*Requisites for Casein Stabilizers*

Casein is the main protein of milk and is isolated from skim milk for a great many industrial uses. Methods of using casein have long been perfected in the fields of gluing, paper making, and painting. For the latex paint industry, a solution in ammoniacal

water is an economical and effective stabilizer. By adhering to one grade and one source of casein, and to a recommended procedure for preparing the stabilizer, the paint maker can be assured of continued success. The importance of securing a uniform grade of casein and adherence to recommended practice in its use cannot be overstressed for casein is a natural raw material with tremendous variations in quality depending upon its origin.

For the latex paint maker two criteria of the quality of casein are of primary importance. These are freedom from dirt and bacteriological purity. The cleanness of casein is determined during its manufacture. Certain other uses for casein do not require a clean product, but the paint maker should insist on freedom from dirt. Exceptionally clean grades of casein are available. Casein is rated for cleanness according to the *American Public Health Association* sediment chart, old scale. On this scale a casein rating 2 or less in sediment should be specified for paint formulation.

The bacteria count in raw casein also varies according to the method of manufacture. Grades of exceptionally pure casein from this standpoint are now being made and allocated. Good keeping quality in water suspension as determined by the Warth incubation test (6) provides an extra safeguard during storage of the paint.

*Prepared Casein Stabilizers*

Casein is the base of a number of prepared stabilizers in both dry and liquid form, designed to relieve the paint maker from special preparation in his plant. As with casein sold as such to the paint maker, the prepared stabilizer should be made with the most uniformly high grade of casein available.

Prepared stabilizers are precompounded with alkalies, preferably potassium or ammonia. Sodium ions in too high a concentration have been shown to contribute to a paint defect in colors, termed efflorescence (3). Ammonia has come to be preferred as the solvent because of its volatility, evaporating from the paint film to leave the casein behind in its original moisture-resistant state. Preservatives are also incorporated in prepared casein stabilizers, giving them unlimited life in storage of either the stabilizer itself or of paints made with it. Some casein stabilizers are also compounded with protein-hardening salts to insure against deterioration of the scrub-resistance of the paint film.

The dry forms of prepared stabilizers are readily dissolved without additives by the paint maker. Warm water-jacketed mixers are useful but not required, as ordinary change-can mixers can be employed if hot water is available. The solutions are usually made up to a 15% concentration, giving a convenient viscosity for blending into the pigment.

Liquid forms of prepared stabilizers are available in concentrations of from about 15% to 50% solids content. Products of the higher concentrations are the more economical. The concentration should be taken into account in the formula calculations by the paint maker. For instance, only one third as much stabilizer of 45% concentration need be used as one of 15% concentration. Liquid stabilizer cost should accordingly be estimated on the basis of concentration or strength, referred to by the analyst as "solids content". On the other hand the viscosity of a stabilizer is no criterion of its quality. Products of low concentration are thin and yet may be as effective as thicker products of high concentration when they are used on equal solids basis.

*Preservatives*

Latex paints are formulated with preservatives to inhibit bacterial and mold growth during storage. The inclusion of a casein stabilizer heightens the need for preservatives. Dual-purpose combinations of chemicals to check both proteolysis and mold growth are being specified. Combinations of phenolic types such as the potassium salts of ortho phenyl phenol and of chlorinated phenols are of proven value. These assure no spoilage under normal storage conditions for periods up to one year or more. The paint maker need have no fear of bacterial spoilage if recommendations are followed.

*Stabilizers for Calcium-Base Pigments*

Incompatibility of casein for calcium base titanium pigments was feared. This made necessary the formulation of a calcium-resistant stabilizer. Starches of converted grades had proved to be compatible. The paint formulas also include a non-ionic wetting agent which in combination with starch provides a pigment grinding medium equivalent to casein. However, the calcium precipitation of casein in this type of paint has not been conclusively shown to be the cause of the difficulties. Stabilizers of one casein type may give satisfactory results whereas others may not. To provide the advantages of casein and yet assure the paint maker of good stabilizing power, processed combinations of starch and casein have been made available for use with calcium base pigments.

Ronai and Weisberg (8) have shown that the thickening of styrene-butadiene paint pigmented with calcium sulfate-extended pigment, or containing calcium carbonate as part of the pigment formula, which occurs when raw casein is used as the stabilizer can be reduced by using (a) potassium caseinate obtained by spray-drying a potassium hydroxide solution of casein, (b) ammonium caseinate obtained by spray-drying an ammonium hydroxide solution of casein, or (c) by heating the casein solution with sodium bisulfite. Complete prevention of thickening is accomplished by using enzyme-hydrolyzed casein. Casein modified in this way gives a paint of thin initial viscosity and is intended to be used with one of the thickeners proper, described below. Enzyme-hydrolyzed casein also gives complete protection to this type of paint against thickening which occurs as the paint is subjected to repeated freezing and thawing.

*Thickeners*

The primary function of casein is to protect the latex particles from agglomerating. Additions are ordinarily made of concentrations which are too low to contribute much to the viscosity of the paint. Protein solutions in general are not very thick, compared to water-soluble gums, certain cellulosic

derivatives and the polymeric acrylates. The use of a thickener in addition to the stabilizer is therefore optional. A number of commercially successful paints do not contain a thickener proper. However, thickeners are useful and recommended in formulas requiring a slight upward adjustment in viscosity. In such cases, either a cellulosic product such as methyl cellulose or carboxymethyl cellulose, or an acrylate in the form of a potassium or ammonium salt is incorporated in addition to the stabilizer. Natural gums and other colloids have also been evaluated, results being generally favorable for the alginates. A point in favor of the thickeners mentioned is their resistance to breakdown at the rather high degree of alkalinity to which a latex paint is adjusted.

Synthetic polymeric acrylate as the potassium salt provides high viscosity to the latex itself at low concentrations and is highly stable in the alkaline pH range encountered in latex paints. Potassium polyacrylate has been found to thicken a typical styrene-butadiene latex paint by 6 K.U. when added at the level of 1.5%, wet basis.

*Viscosity Stability*

Viscosity changes in experimental paints, if they are to occur, can be accelerated by storing the paint in closed containers at some elevated temperature. At 140°F for instance viscosity changes caused by chemical activity will occur from 8 to 10 times as fast as in storage at temperature of 80°F.

The Krebs paddle in a Stormer viscometer (4) is customarily used in gauging the viscosity of latex paint. This is advantageous because of the almost universal use of the same method for oil-base paints. Krebs Units are neither time nor weight units but they provide a positive scale of simple values ascending as the paint is thicker. From 62 K.U. to 86 K.U. is specified for government purchases of latex paints (5). Latex paints are not usually highly thixotropic, but that they do thin down on stirring and thicken again on standing was shown by Bixler (2).

An alternative instrument for viscosity determination is the Brookfield rotational viscometer (2). Viscosity values are expressed in centipoises (cps), and the K.U. range given above corresponds approximately to the range 1000-5000 cps, running the Brookfield at 20 rpm. This conversion can be expected to vary slightly one way or the other in paints of different composition. A third viscosity test is that of an efflux type in which a predetermined volume of paint is allowed to drain from a cup (6).

A well-stabilized paint will maintain its viscosity at 140°F for at least 300 hours. For instance, no substantial drift occurred in this period in the following paint, ingredients being shown in percent by weight:

| | |
|---|---|
| Titanium dioxide | 22.1% |
| Lithopone | 6.3 |
| Mica | 3.1 |
| Tetrasodium pyrophosphate | 0.2 |
| Water | 15.8 |
| Casein-starch Stabilizer (20%) | 7.0 |
| Dowicide A/G (15%) | 1.6 |
| Pine Oil | 0.4 |
| Tributyl phosphate | 1.2 |
| Dow Latex 762W | 42.3 |

| | |
|---|---|
| Initial Viscosity | 82 K.U. |
| Viscosity after 300 hrs. at 140°F | 82 K.U. |

A post-plasticized poly-styrene paint formulated on the heavy side with a straight casein stabilizer thinned slightly in the 300-hour period:

| | |
|---|---|
| Titanium dioxide | 25.0% |
| Mica | 6.0 |
| Monsanto Lustrex 820 | 2.0 |
| Water | 29.5 |
| Defoamer | 1.0 |
| Ammonia | 0.5 |
| Santicizer 160 | 8.0 |
| Casein Stabilizer (20% Solution) | 3.0 |
| Monsanto Lustrex 601-40 | 25.0 |

| | |
|---|---|
| Initial viscosity | 94 K.U. |
| After 300 hours at 140°F | 90 K.U. |

Gradual loss of viscosity in a stored paint has been attributed to the thinning out of the stabilizer itself. At the relatively high pH (8.5-9.5) of the paint and in the presence of preservatives, the splitting of the casein, if it occurs, is probably due to alkaline hydrolysis rather than to bacteriological destruction. At the relatively low concentration of from 1% to 2% of casein in the paint, it is doubtful if loss of viscosity can be attributed to a thinning down of the casein per se. However, this point has not been thoroughly investigated.

*Freeze-Thaw Stability*

Determination of the resistance of a paint to freezing and thawing has not been reduced to a standard test procedure. The Northwestern Club of the Federation of Paint and Varnish Production Clubs published the results of tests of 5 protein stabilizers in 1952 (1). Freezing of a half-full pint can was done at 0°F for 16 hours, allowed to thaw, and held at room temperature for 7 hours. Freezing and thawing were repeated for 3 cycles. Paint made with one grade of styrene-butadiene latex was not freeze-thaw stable unless it was prepared with a protein whereas a second paint made with another grade of the same type of latex failed in one cycle even when made with a protein stabilizer. None of the plasticized polystyrene paints passed this test.

Our laboratory has found freezing to be more damaging if it occurs slowly in a large size container. One-gallon samples of paint are held overnight at 40°F, then stored at 0°F for another overnight period. Thawing takes place at room temperature. The styrene-butadiene paint given above stood up well for three such cycles but thinned down to 65 K.U. The polystyrene paint was severely damaged in one cycle. Evidently there was not enough casein present to protect the latex in this paint.

*Method of Preparing Stabilizer*

Stabilizers in dry form are all dissolved in hot water by the paint maker. Casein is brought into a 15% solution as follows: Soak ten parts of casein in 67 parts by weight of warm water held in a kettle with agitation. When the casein is thoroughly wet add one part of full strength (26°) ammonia and bring to 180°F. Hold at this temperature for 15 to 30 minutes and cool. A change-can mixer is suitable if hot water is available.

The reverse method of heating the casein and water before adding the ammonia is sometimes recom-

(*Turn to page 77*)

# MONOMER MODIFICATION OF OILS ANE ALKYDS FEATURED AT ACS PAINT DIV. MEETING

Over 13 thousand chemists and chemical engineers from universities, chemical companies, government laboratories and research institutes in all parts of the United States and many foreign countries met in New York for the 126th national meeting of the American Chemical Society, which was held during the week of September 12th. More than 1,350 scientific papers were presented on the programs of the ACS' 21 divisions in the various fields of chemical science and technology.

Some 500 members assembled in the Governor room of the Governor Clinton Hotel to hear 26 papers dealing with various phases of paint technology and chemistry. This was part of the program arranged by the Division of Paint, Plastics and Printing Chemistry.

Two interesting symposia, one dealing with developments of interior finishes, and the other concerned with monomer modification of oils and alkyds were presented during this meeting.

John K. Wise presided over the symposium on Development of Interior Wall finishes and the group heard papers by Henry F. Payne of the American Cyanamid Co., A. E. Kromer and A. Olotka, Archer-Daniels-Midland Co., and D. A. Kohr, Jr. of the Sherwin-Williams Co.

Payne discussed the types of interior wall finishes that are being currently used with particular emphasis on the latex and alkyd flats. He traced the development of these two types during the past five years and briefly touched on the properties of each.

Kromer presented a paper covering the developments of oleoresinous flats. He pointed out that through research alkyd flats were developed which overcame some of the weaknesses found in the conventional types. These exhibited such properties as good bridging, scrub resistance, stain removal, enamel hold out, etc.

Kohr traced the technological progress that has taken place in latex paints and emphasized the importance of additives and the part they contribute to the successful performance of the latex systems. He then discussed, in detail, the function of protective colloids, mildew inhibitors, preservatives, foam depressants, plasticizers, coalescing agents, and pigments.

The desirable properties of a latex paint, such as ease of application, free from odor, ease of clean-up of application devices, good washability characteristics will increase their usage in the future, Mr. Kohr forecasted.

Upgrading of drying oils and alkyds by monomer modification have taken on added significance during recent years in view of the paint chemist's quest to develop finishes with improved properties.

Wayne Norris of the American Cyanamid Co. presided over a very informative and enlightening symposium dealing with monomer modification of oils and alkyds. This was attested by the fact that some nine papers were delivered on the subject. These included studies on properties and uses of styrenated alkyds, styrene modification of oils and alkyds, styrenation of alkyds having controlled maleic functionalities, vinyl-toluene-divinylbenzene modification of drying oils, acrylonitrile as a modifier in styrenated alkyds, vinyl modification of drying oils and alkyds, treatment of vegetable and fish oils with *tert*-butyl peroxide, and analytical studies of styrenated alkyds.

The accompanying photographs show some of the members and guests who were in attendance.

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Decyl Alcohol
Denatured Ethyl Alcohol

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PETROHOL 95
PETROHOL 99
JAYSOL
Iso-Octyl Alcohol
Decyl Alcohol
Denatured Ethyl Alcohol
Tridecyl Alcohol
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# NEWS

Roy H. Kienle

### R. H. Kienle Heads Cyanamid's Research Service Department

Creation of two new departments of American Cyanamid Company's Research Division were announced by Mr. K. H. Klipstein, General Manager of the Company's Research Division. They are: the Basic Research Department, and the Research Service Department, both at the Stamford Research Laboratories.

Dr. D. J. Salley was named assistant director of the Basic Research Department (Dr. J. T. Thurston, director of the Stamford Research Laboratories, will be acting Director of the Department) and Dr. R. H. Kienle was named director of the Research Service Department. Dr. R. P. Chapman will be assistant director of the Department.

The Research Service Department is a consolidation of numerous service functions at Stamford, including the library, analytical and testing, instrumentation, etc. It will, in addition to rendering services to other departments, carry on research in methods and instrumentation.

Dr. Kienle joined Cyanamid in 1933 as a research chemist at the Bound Brook, N. J., Laboratories of the former Calco Chemical Division. Three years later he became assistant research director for the Division and in 1952 director of applied research. Before joining Cyanamid he was employed by DuPont, General Electric and the U. S. Bureau of Mines.

He received his B. S. degree in Chemistry in 1916 from Worcester Polytechnic Institute, and M. S. degree in 1927 from Union College and a Ph.D. from Rutgers University in 1938. He has been a Trustee of Williston Academy, Easthampton, Mass., since 1951.

### Hercules Powder to Hold Coatings Symposium in Los Angeles, Nov. 1-5

A coatings symposium for the West Coast protective coatings industry will be conducted by Hercules Powder Company in Los Angeles, November 1-5.

Designed to acquaint the protective coatings industry with new developments in a wide variety of fields, the symposium is endorsed by the Los Angeles Paint and Varnish Production Club and the Los Angeles Paint, Varnish and Lacquer Association.

All sessions of the symposium will be held in Los Angeles' Roger Young Auditorium. Subjects will include lacquers for wood, metal, and paper; synthetic resins the use of pentaerythritol in coating resins; and Hercules chlorinated rubber in corrosion-resistant and other protective coatings.

In addition to Hercules representative there will be three prominent guest speakers on the panel.

Frank B. Havens, manager, West Coast Pigments Division, American Cyanamid Company, will discuss "Practical Aspects of Pigment Dispersions." J. W. Dayton, Los Angeles manager of the DeVilbiss Company, will show a movie "Making the Most of Spray Painting Methods" and lead a discussion on this subject.

The third guest speaker, W. A. McCormick, Solvents Department, Shell Chemical Corporation, will have as his subject "Solvent Economic in Formulating Lacquers."

The program is as follows:

**Monday, November 1, 1954**

*8:30 a.m.* Registration
*9:00 a.m.* Welcome—Robert L. Skov, William F. Power
*9:15 a.m.* Movie—Problem, Solution, Result. . .J. G. Fuller, Jr.
*9:45 a.m.* Principles of Lacquer Formulation. . .Rufus F. Wint
*11:00 a.m.* Principles of Lacquer Formulation. . .Gregory N. Bruxelles
*12:15 p.m.* Get-Acquainted Lunch
*1:30 p.m.* Nitrocellulose and Its Properties. . .Rufus F. Wint
*3:15 p.m.* Glossiness of Lacquer Finishes. . .Gregory N. Bruxelles

**Tuesday, November 2, 1954**

*9:00 a.m.* Lacquer Primers and Other Military Lacquer Specification Finishes
Gregory N. Bruxelles
*10:45 a.m.* High-Solids Lacquers for Metal and Wood
Rufus F. Wint
*12:15 p.m.* Lunch
*1:30 p.m.* Solvent Economies in Formulating Lacquers
W. A. McCormick
*3:30 p.m.* Hot-Spray Lacquers—Movie and Lecture
Rufus F. Wint

**Wednesday, November 3, 1954**

*9:00 a.m.* Analytical Methods for Lacquers. . .Robert L. Skov
*9:30 a.m.* One-Coat Multicolored and Texture Lacquers
Rufus F. Wint
*11:00 a.m.* Methods of Applying Lacquers-Airless, Aerosol Spray; Movie—Flight to Lacquer
Gregory N. Bruxelles
*1:30 p.m.* Tailor-made Resins and Plasticizers for Metal, Wood, and Paper Lacquers
J. Glenn Little
*3:15 p.m.* Ethyl Cellulose Coatings for Difficult Surfaces
Gregory N. Bruxelles

**Thursday, November 4, 1954**

*9:00 a.m.* Chemical and Physical Characteristics of PE-Effect and Use in Coating Resins. . .J. Glenn Little
*10:45 a.m.* Parlon (Chlorinated Rubber) Coatings for Corrosion Resistance
Gregory N. Bruxelles
*1:30 p.m.* Trends in the Use of Rosin Derivatives—Protective Coatings. . .J. Glenn Little
*3:30 p.m.* Parlon (Chlorinated Rubber) Its Versatility in Protective Coatings. . .J. G. Fuller, Jr.

**Friday, November 5, 1954**

*9:00 a.m.* Practical Aspects of Pigment Dispersions
Frank B. Havens
*10:45 a.m.* Parlon—The Solution of Special Problems
a. Stability
b. Gelation
c. Gloss
Gregory N. Bruxelles
*1:30 p.m.* Making the Most of Spray-Painting Methods—Movie
J. W. Dayton
*3:30 p.m.* Closing Session—General Discussion
R. L. Skov, Leader

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### Selas Opens St. Louis Office

An expansion in the field sales organization of Selas Corporation of America, Philadelphia, heat and fluid processing engineers, is announced by F. O. Hess, president, with the formation of a St. Louis sales zone.

The new zone will be headed by Robert M. Breckenridge, who will make his headquarters within the metropolitan area.

In addition to St. Louis, Selas has district offices in principal cities throughout the country.

The St. Louis office will be located initially at 8643 Brookshire Lane, University 24, Missouri.

# NEWS

W. Strickler, right, vice president of the University of Louisville, greets J. H. Kolseth, exec. vice president of Devoe & Raynolds Co., and 22 of the company's top sales executives upon the opening day (Aug. 30) of Devoes's week long sales management forum at the university. Object of the seminar was to freshen outlook of Devoe's sales people on their own problems.

### Devoe & Raynolds Forum Hear Steig's View on Latex Sales

Production and sales of latex—rubber base—paint have passed their peak and will level off at 30 million gallons a year until a new type of readily merchandised water thinned paint makes its appearance, Fred B. Stieg, Director of the Technical Service Laboratory of the Titanium Pigment Corporation, estimated in a talk to the Sales Management Forum of Devoe & Raynolds Company, Inc., at the University of Louisville, Louisville, Ky., on Thursday, September 2.

Twenty-two top sales executives of Devoe were assembled for what is believed to be the first corporation-sponsored marketing forum held at an institution of higher learning. The executives met for the five days during the week of Monday, August 30 through Friday, September 3. For four days they analyzed case histories of marketing problems of companies making varied types of consumer goods. On Thursday, however, they heard addresses by Mr. Stieg, by Dr. Bergil Reed, vice president of the J. Walter Thompson Company, and by two officials of du Pont de Nemours and Company: Robert H. Pohl, assistant director of sales of the Pigments Dept.; and Dr. William E. Lusby, representative of the Special Products Division.

Stieg traced the decrease in importance of latex paints to the fall of 1952 when, he said, "the counter attack of the resin and solvent manufacturers—odorless alkyd flat wall paint—was already under way, Jones Dabney Company having sparked the entire alkyd flat development by their introduction of Syntex 131 in the spring of 1949. Color tube systems," he continued, "offering a choice of literally hundreds of colors in oleo-resinous and alkyd systems, also had much to do with slowing down the growth of latex paint sales."

Mr. Stieg said that a reliable store audit indicated that 35 millions of gallons of latex paint were sold in 1953, He added, however, that acrylic and an ever increasing list of P.V.A. copolymers are competing with butadiene-styrene latex and that for this reason latex paints of the type first introduced must not only have levelled off but, during the past year, actually decreased in volume.

Comparing the history of latex paints to resin emulsions, Mr. Stieg reported that the original impetus given to latex has subsided after five years. Their use for exterior paints, he said, will be limited to paints for cement, stucco and asbestos shingle. He does not expect them to prove satisfactory for use over wood.

Mr. Stieg said that a water-soluble alkyd might very well replace latex. "Yours guess as to *when* may be better than mine," he told the Devoe sales executives, "but such vehicles *are* in the development stages and—if successful as air-drying finishes—I predict that they will replace latex paints just as fast as latex replaced resin emulsion paints."

### Du Pont Plans New Lab for Pigments Dept.

Plans for construction of a $2,550,000 laboratory building here for long-range and fundamental research by Du Pont's Electrochemicals and Pigments departments were recently announced by the company. Facilities for each department will be provided in separate wings of the building, which is being shared for reasons of economy.

It was the second new laboratory building to be scheduled for erection at the Du Pont Experimental Station since a $30,000,000 expansion program was completed there a little more than three years ago. Last June, the company disclosed it would build a $1,275,000 laboratory at the Station for Film Department research. Work on this building is now under way.

The latest laboratory project will provide about 50 scientists of the Pigments and Electrochemical departments with additional space and the newest in facilities for the kinds of research which, in the past, have led to the development of new products and new industries.

The Pigments Department plans to transfer scientists from the crowded laboratory at Newport, Del., to join those now using temporary space at the Experimental Station. Substantial research, including titanium metal studies, will remain at Newport, while new pigment color studies will be continued at Newark, N. J., where a new research laboratory is under construction.

The Pigments Department will emphasize new products research in the new Experimental Station laboratory. This is in line with the department's policy of increasing long-range and exploratory work as a route to diversification of its present fields of activity.

•

### Walter Clark to Supervise Nuodex Cooperative Program

Leo Roon, president of Nuodex Products Co., Inc., announced that Walter M. Clark has been placed in charge of the company's program to cooperate with the paint industry in developing the market for packaged wood preservatives.

As manager of paint fungicide sales for Nuodex, Clark has taken an active part in streamlining the merchandising of mildew resistant paints, which are enjoying accelerated sales throughout the industry.

"It is our objective" says Clark "to cooperate similarly with the paint manufacturer in his approach to this closely related field of packaged wood preservatives. It is building up in importance as the "do-it-your-self" market grows. Paint industry distribution channels are made to order for these products. We intend to offer the paint manufacturer all the data and sales aids that he needs to make participation in this market a simple, profitable move."

# BENTONE* GELLING AGENTS IN MODERN PAINT FORMULATIONS

**...one of a series of condensations from laboratory reports detailing uses of *BENTONES* 18-C and 34**

## *VINYL ANTI-FOULING PAINT STORAGE PROBLEM SOLVED BY NEW BENTONE 18-C*

*BENTONE* 18-C answers the very critical storage problem presented by a high concentration of cuprous oxide in vinyl antifouling paint. This new *Dutch Boy* gellant was specially developed by National Lead research to attain full gel structure easily in highly polar vehicles. Thus, in the following typical formulation, it efficiently retards pigment settling, makes re-incorporation of cuprous oxide easy.

### *Typical "Good Storage" Formula*

| MATERIAL | LBS. | GALS. |
|---|---|---|
| Cuprous Oxide | 800 | 15.7 |
| *BENTONE* 18-C | 15 | 1.0 |
| Vinylite Resin VYHH | 80 | 7.1 |
| Rosin | 80 | 8.9 |
| Tricresyl Phosphate | 30 | 3.0 |
| Methyl Isobutyl Ketone | 275 | 41.1 |
| Xylene | 180 | 24.8 |
| | 1460 | 101.6 |

## *BENTONE 34*

### Aids Mastic Compounding

Production and performance of putty, caulking compounds, and wood fillers are improved by *DUTCH BOY BENTONE* 34. Since adhesion, rate of setting, and hardening remain unaffected, no reformulation of proven trade items is required. The effect of *BENTONE* 34 is to improve:

*Initial wetting of fillers.* Reagglomeration of particles is prevented, need of "sweating" new batches is virtually ended.

*Storage properties.* Compounds seldom require reworking before use since *BENTONE* 34 minimizes oil separation or hardening.

*Working properties.* By controlling flow characteristics, *BENTONE* 34 establishes a good balance of working properties... makes formulations applicable in both hot and cool weather.

*Performance. BENTONE* 34 improves both dimensional stability and moisture resistance.

### *Gives stains better flow properties*

*BENTONE* 34 helps control flow characteristics in stains. In standard stains, it minimizes streaking, bleeding, migration of colorant. In shingle stains, it controls bad draining tendencies, insures uniform film thickness and easy application. In both types, it reduces sagging, controls penetration, imparts package stability and assures shade uniformity.

## Just Out! New!

### *BENTONE* 18-C HANDBOOK

This new, 28-page, *"DUTCH BOY BENTONE* 18-C HANDBOOK" is packed with valuable information. It gives properties, theory, incorporation, effects, and typical formulations of *BENTONE* 18-C. Write for free copy. Ask for the *BENTONE* 34 Handbook, too ...if you don't already have one.

*Dutch Boy** CHEMICALS

**"Dutch Boy" and "Bentone" are registered trademarks of National Lead Company.*

**NATIONAL LEAD COMPANY**
**111 Broadway, New York 6, N. Y.**
In Canada: CANADIAN TITANIUM PIGMENTS LIMITED
630 Dorchester Street, West • Montreal

# NEWS

### Sinclair Announces Expansion In Petrochemicals Field

Continuing its expansion in the petrochemical field, Sinclair Chemicals, Inc., a subsidiary of Sinclair Oil Corporation, announced the start of construction of petrochemicals producing plant here at its Marcus Hook refinery. The plant will produce 18,000,000 gallons per year of pure aromatic hydrocarbons including toluene, xylenes and paraxylene which will be supplied to the chemical and allied industries for the production of plastics, synthetic fibers, paints, medicinals and other chemical products.

### 72 Firms Exhibiting at Forth-Coming Paint Show in Chicago

Seventy-two firms have engaged exhibit space for the forthcoming Paint Industries' Show to be held November 16th thru 20th at the Palmer House in Chicago, Ill.

The Show, held in conjunction with the Annual Meeting of the Federation of Paint and Varnish Production Clubs, will open Tuesday at noon and will close Saturday at noon.

The list of exhibitors is as follows:

Abbe, Paul O., Inc., Advance Solvents & Chemicals Corp., American Cyanamid Co., Anderson-Prichard Oil Corp., Archer-Daniels-Midland Co., Atlas Electric Devices Co., Bakelite Co., Baker Castor Oil Co., Barrett Division, Bennett Industries, Inc., Binney & Smith, Inc., Bowser, Inc., Brighton Copper Works, Inc., Cabot, Godfrey L., Inc., Carbide & Carbon Chemicals Co., Carbola Chemical Co., Inc., Carbon Dispersions, Inc., Cargill, Inc., Catalytic Combustion Corp., Celanese Corp. of America, Coors Porcelain Co., Cuno Engineering Corp., Day, J. H. Co., Inc., Dow Chemical Co., du Pont, E. I. de Nemours & Co., Inc., Eastman Chemical Products, Inc., Epworth Manufacturing Co., Firestone Plastics Co., Gardner Laboratory, Inc., General Electric Co., Geuder, Paeschke & Frey Co., Goodyear Tire & Rubber Co., Inc., Harshaw Chemical Co., Hercules Powder Co., Hockmeyer, Herman & Co., Kellogg, Spencer & Sons, Inc., Kent Machine Works, Inc., Kinetic Dispersion Corp., Lacquer Information Center, Lehmann, J. M. Co., Inc., Macbeth Corp., Manufacturers Eng. & Equip. Corp., Metals Disintegrating Co., Mineral Pigments Corp., Minerals & Chemicals Corp. of America, Monsanto Chemical Co., Morehouse Industries, Naftone, Inc., National Starch Products, Inc., Neville Chemical Co., Nopco Chemical Co., Nuodex Products Co., Inc., Pacific Vegetable Oil Corp., Patterson Foundry & Machine Co., Pennsylvania Industrial Chemicals Co., R-B-H Dispersions, Reichhold Chemicals, Inc., Rheem Manufacturing Co., Rohm & Haas Co., Ross, Charles & Son Co., Ross & Rowe, Inc., Sharples Chemicals, Inc., Shell Chemical Corp., Shell Oil Co., Sherwin-Williams Co., Sparkler Manufacturing Co., Troy Chemical Co., Troy Engine & Machine Co., U. S. Stoneware Co., Washburn, T. F. Co., Williams, C. K. & Co., and Witco Chemical Co.

•

### Navy Has New Specification On Zinc Chromate Primer

Navy's Bureau of Aeronautics is setting up a Qualified Products List under its specification MIL-P-8585 (Aer), Corrosion Inhibiting, Low Moisture Sensitivity Primer for Aircraft Use. It is planned that this specification will replace Type I Zinc Chromate Primer in Spec. MIL-P-6889A.

Suppliers have experienced difficulty meeting the requirements of MIL-P-6889A, particularly because of seeding or gelation in the can. Paint technologists believe pigment basicity combined with resin acidity cause this condition. The Bureau of Aeronautics has authorized a research project for study of the problem.

MIL-P-8585 (Aer) requires 16-19% oil modified phenol-aldehyde resin and 81-84% alkyd resin in the vehicle. Copies of the specification are available from Commanding Officer, U. S. Naval Air Station, Johnsville, Pa., Attention: Technical Records Division.

•

### Palmer-Shile Names Two Representatives

Two new sales representatives have been added so far this year, it was announced by Palmer-Shile Co., Detroit 27, Michigan, designers and manufacturers of materials handling equipment.

They are W. P. Wooldridge Co., 1183 Howard Street, San Francisco 3, California, and 6440 Fleet Street, Los Angeles 22, California; and Carl Krasny, 6801 Euclid Avenue, Cleveland 3, Ohio.


Surface Treatment means Protection

*In CARBON BLACK, that means . . .*

BLACK PEARLS-O*

*Black Pearls O . . . surface treated to protect your PROCESS by guaranteeing rapid and complete dispersion, and to protect your PRODUCT by prevention of gelation or bodying on storage.*

CABOT

GODFREY L. CABOT, INC.
77 FRANKLIN STREET, BOSTON 10, MASS.

*Available in fluffy form as ELF-O

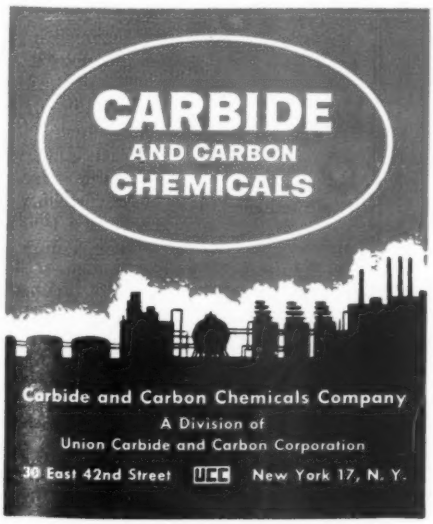
# CELLOSOLVE® and CARBITOL®

## TRADE-MARKS FOR CARBIDE'S HIGH QUALITY GLYCOL-ETHERS

Back in the late 1920's Carbide and Carbon Chemicals first used the trade-marks CELLOSOLVE and CARBITOL to identify its new glycol-ethers. Today, with 25 years of experience producing these products, CELLOSOLVE and CARBITOL have become the accepted symbols for CARBIDE's high quality glycol-ethers in dozens of industries where they are used.

If you are considering glycol-ethers in your production, why not check the list below. There may be one or more high quality products to suit your particular needs.

| | |
|---|---|
| CELLOSOLVE Solvent | Ethylene Glycol Monoethyl Ether |
| CARBITOL Solvent | Diethylene Glycol Monoethyl Ether |
| Methyl CELLOSOLVE | Ethylene Glycol Monomethyl Ether |
| Butyl CELLOSOLVE | Ethylene Glycol Monobutyl Ether |
| Methyl CARBITOL | Diethylene Glycol Monomethyl Ether |
| Butyl CARBITOL | Diethylene Glycol Monobutyl Ether |
| 2-Ethylbutyl CELLOSOLVE | Ethylene Glycol 2-Ethylbutyl Ether |
| n-Hexyl CELLOSOLVE | Ethylene Glycol n-Hexyl Ether |
| n-Hexyl CARBITOL | Diethylene Glycol n-Hexyl Ether |
| Phenyl CELLOSOLVE | Ethylene Glycol Monophenyl Ether |
| Phenyl CARBITOL | Diethylene Glycol Monophenyl Ether |




**A FEW OF THEIR MANY USES:**

- *Solvents in surface coatings*
- *Solvents in dyestuffs, wood stains, and inks*
- *Mutual solvents in soaps, oils, and insecticides*
- *Diluents in brake fluids*
- *Intermediates for plasticizers*

**If you want more information on the uses, delivery, or prices of these high quality glycol-ethers, call the CARBIDE office nearest you. A technical representative will be glad to help you. In Canada: Carbide Chemicals Sales Company, Division of Union Carbide Canada Limited, Toronto.**

# NEWS

### DeSoto Receives Citation For Modernized Plant

DeSoto Paint & Varnish Co., Garland, Texas, has been cited by "Factory Management & Maintenance," a McGraw-Hill publication, as one of the foremost modern plants built in the United States during the last year.

The magazine presented the paint firm's General Manager, M. H. Warren, with a large parchment scroll citation. The editors of "Factory Management & Maintenance" chose the DeSoto plant because of its modern design and common sense construction which will facilitate future expansion without a great deal of additional capital. For example, the plant, which at present can produce two million gallons of paint per year, based on a 40-hour week, could easily expand to a three million gallon capacity without installation of a large amount of additional equipment.

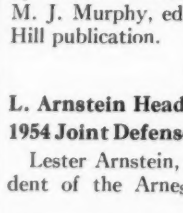
Desoto officials look on as citation is being presented to M. H. Warren, Gen'l. Mgr. L to R: T. Ingram, Prod. Supt., D. Hays, Personnel Mgr., J. Scarborough, Purchasing Agent, A. DaValle, Resin Plant Mgr., F. Minner, Tech. Director, A. Holcomb, Gen. Sales Mgr., R. Lester, Comptroller, J. Cash, Mgr. of McGraw-Hill Regional office, Dallas, Tex. Seated: M. H. Warren.

The award winning citation is signed by Alfred M. Staehle, publisher, and M. J. Murphy, editor of the McGraw-Hill publication.

•

### L. Arnstein Heads Paint Div. of 1954 Joint Defense Appeal Campaign

Lester Arnstein, executive vice-president of the Arnesto Paint Co., Inc., has accepted chairmanship of the Paints & Chemicals Division of the 1954 Joint Defense Appeal campaign, it was announced by William Sachs, chairman of Trades & Industries for JDA in Greater New York.



Lester Arnstein

Mr. Arnstein, who served in a similar capacity last year, will once again rally the Paints & Chemicals Industries behind JDA's effort to raise New York's quota of the $5,000,000 national goal sought by the American Jewish Committee and the Anti-defamation League of B'nai B'rith. AJC and ADL are the nation's oldest and largest Jewish community relations organizations combatting bigotry, promoting better relations among Americans of all races and creeds and safeguarding human rights.

The signboard points to only three of several definite advantages of Dicalite Extenders in the formulation of traffic paints. *Longer-Lasting* should also be mentioned.

**BRIGHTER,** because this high-grade diatomaceous material reduces the glare which makes traffic lines disappear from sight, while retaining high light reflectance for improved visibility under all light conditions.

**TOUGHER,** because the 'interlocking' action of the diatomite particles gives a stronger, more elastic film which resists abrasion.

**FASTER-DRYING** is due to this 'interlocking' action which provides minute pores for easier solvent release, and for better evaporation of moisture which comes up through the pavement under the paint, and is a major cause of blistering and peeling. And that means *Longer Service Life!*

For complete information on the many uses of Dicalite in paint manufacture, together with suggested formulations worked out by paint experts in consultation with Dicalite engineers, write for Bulletin C-22.

• DICALITE DIVISION
Great Lakes Carbon Corp.,
612 South Flower Street,
Los Angeles 17, California

Dependable GLC GREAT LAKES Dicalite® DIATOMACEOUS MATERIALS

# NEWS

A. D. Joyce

### A. D. Joyce, Founder of Glidden Co., Succumbs

Adrian D. Joyce, chairman of the Glidden Co., died on August 25th at his home in Shaker Heights, Ohio. He was 81.

Mr. Joyce purchased the Glidden Varnish Co. in 1917 and built it up to one of the largest and leading paint firms in the world. The firm branched out into other segments of the chemical field, and today, Glidden divisions not only produce paints and varnishes but supply chemicals, pigments, metals, soya products, vegetable oils, naval stores, fertilizers, pharmaceuticals, feed and foodstuffs. It does an annual business of more than 250 million dollars a year.

Last year, the Cleveland Chamber of Commerce awarded Mr. Joyce the Cleveland Medal for Public Service in recognition of his achievements in the fields of business, philanthropy, civic improvements, and humanitarianism.

He belonged to the Union Club, Mid-Day Club, City Club, and the Mayfield Country Club, the Kirtland Country Club, the Union League Club of Chicago, the Congressional Country Club, Washington, D. C., and the Seigniory Club of Quebec.

•

### G. C. Petersen of National Lead's Pacific Branch Retires

Retirement of George C. Petersen, credit manager of the Pacific Coast Branch of National Lead Company, was announced recently at a dinner given in honor of his completion of forty-five years of service with the company. He was presented with a 45-year service pin.

### Reichhold Announces Completion Of Formaldehyde Plant in N. C.

Reichhold Chemicals, has currently under construction a formaldehyde producing installation at its plant in Charlotte, N. C. The new unit, which will be completed and in operation by October 15, will be the first formaldehyde plant in the middle South.

The unit will have an annual capacity of 25,000,000 pounds and will be the fourth formaldehyde plant operated by Reichhold in the United States. Other Reichhold formaldehyde units are located in Seattle, Bellardvale, Mass., and Tuscaloosa, Ala.

With the completion of the new Charlotte unit, Reichhold's total formaldehyde capacity will exceed 100,000,000 pounds annually, making the company one of the major producers of this basic chemical in the United States.

Formaldehyde is widely used in the manufacture of a broad range of products. Combined with phenol, it provides phenol-formaldehyde laminating resins as well as resins for surface coatings and shell molding and casting in the foundry industry.

•

### D. B. Becker Representing A. J. Wittenberg Company

D. B. Becker Co., 150 Nassau St., New York City, has been appointed sales agents for the A. J. Wittenberg Co. of Jacksonville, Fla. for the New York metropolitan area. A. J. Wittenberg manufacturers a line of synthetic resins.


Get in touch with

**PICCO**

for high quality, dependably uniform

**SOLVENTS AND SOLVENT OILS**

**HAVE YOU TRIED PICCO SOLVENTS?**

***Here are some typical applications—***

For preservative treatments, involving copper naphthenate and pentachlorophenol — **Shingle Stain Oil and 538 Heavy Naphtha.**

For paint and varnish removers— **LBAN (low-boiling aromatic naphtha) and Extra Light Solvent Naphthas.**

For the production of lacquers, lacquer thinners, and can coatings— **HiSolv T.**

For the production of finishes for metal, automotive, electrical consumer appliances, and furniture— **HiSolv 30 and 534.**

For Enamel Oil coatings, baked alkyd finishes and chlorinated rubber coatings— **HiFlash Naphtha.**

For roof cements, pitch coatings, and asphalt impregnation — **Heavy Naphthas.**

For pipe line enamel and primer, and by-product pitch coatings— **EW Solvent Naphtha.**

For roller coatings, and to control the flow in dipped coatings, and for the new types of electrostatic spraying— **HiSolv 473.**

To adjust the solvent power of mineral spirits for varnish and alkyd resin manufacture— **HiFlash Naphtha or HiSolv 534.**

To control the brilliance, and to get good leafing in gold and aluminum bronze finishes — **HiFlash Naphtha.**

As a resale item, to go with your specialty industrial coatings— **HiSolv 534 and HiSolv 38.**

**PENNSYLVANIA INDUSTRIAL CHEMICAL CORP.** CLAIRTON, PA.

*Plants at Clairton, Pa.; West Elizabeth, Pa.; and Chester, Pa.*
*District Sales Offices: New York—Chicago—Philadelphia—Pittsburgh*

PICCO

Pennsylvania Industrial Chemical Corporation, PVP
Clairton, Pennsylvania

Please send samples and complete data on PICCO _____, to be used for (application) _____

Name _____ Position _____

Company _____

Address _____

EXPLOSION-PROOF

# ...SAFETY

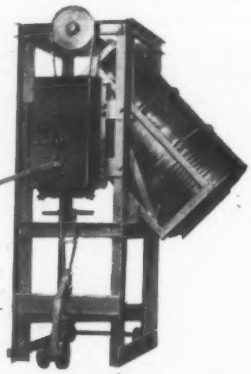
## with REVOLVATOR®

**MANUAL** OPERATION

MATERIALS HANDLING EQUIPMENT

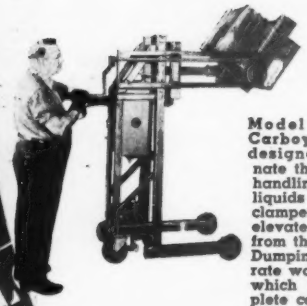
***For 50 years, Revolvator Company has been designing specialized equipment to keep stride with the rapid growth of the paint industry. High volatility of materials used required the greatest attention be paid to explosion-proof techniques. The following equipment is designed to eliminate most explosion hazards from this source.***

**Revolvator Drum & Barrel Stands,** furnished with or without wheels in 18" height. Model shown has wheels for ease of maneuverability.



Model 131XH78—for Side Dumping at Limited Heights. A piece of equipment especially adapted to paint production.

Crane hung drum tilter is designed to operate from an overhead hoist and is operable by hand wheel as shown. Has been adopted throughout all processing industries because of its maximum control.



**Model 160THD35 Carboy Dumper** is designed to eliminate the danger inherent in the handling of acids and similar liquids manually. The carboy is clamped under the cleats and elevated by a hoist unit operated from the back of the Revolvator. Dumping is by means of a separate worm and gear mechanism which gives the operator complete control at all times.

**Model 13TH63.** This is a Revolvator barrel dumper designed for the safe and speedy emptying of the contents, liquid or solid at various heights. Simple to operate. Maintains complete control of dumping operation.

**REVOLVATOR CO.**
8703 Tonnele Ave., North Bergen, N. J.

EXPLOSION-PROOF

## HALF A HUNDRED YEARS OF SERVICE TO THE PAINT INDUSTRY

**Revolvator Co. specializes in explosion proof materials handling equipment.**

Pioneering in materials handling—Revolvator Co., early in its history, was brought into the finishing industries where materials handling has the increased problem of hazardous volatilities. The correct use of nonferrous metals, the protection of electrical fittings, switches, etc., the avoidance of exposed wires; all these phases have been evaluated and planned in the very complete line of Revolvator Co.'s materials handling equipment.

Revolvator Co. equipment has become a standard wherever hazardous materials are involved and present users of its equipment are spread throughout all industries, including such names as:

***American Cyanamid Co.***
***American Distilling Co.***
***American Lacquer Solvents Co.***
***American Marietta Co., Inc.***
***Baker Bros. Paint & Varnish Co.***
***F. W. Berk & Co., Inc.***
***Calvert Distilling Co.***
***Curtis-Wright Corp.***
***E. I. DuPont de Nemours & Co., Inc.***
***Egyptian Lacquer Manufacturing Company***
***Esso Standard Oil Co.***
***Everseal Manufacturing Co., Inc.***
***Joseph S. Finch & Co., Inc.***
***Benjamin Franklin Paint & Varnish Co.***
***Gane's Chemical Works, Inc.***
***General Aniline & Film Corp.***
***General Petroleum Co.***
***General Electric Co.***
***Gillespie Varnish Co.***
***Hercules Powder Co.***
***Mac-Lac Co., Inc.***
***Mack Molding Co., Inc.***
***Merck & Co., Inc.***
***Benjamin Moore & Co.***
***Nuodex Products Co., Inc.***
***Pettit Paint Co., Inc.***
***Pharma Chemical Corp.***
***Publicker Commercial Alcohol Corp.***
***Randolph Products Co.***
***Rohm & Haas Co.***
***Shell Oil Co.***
***Sherwin-Williams Co.***
***Solar Compounds Corp.***
***Subox, Incorporated***
***Sun Chemical Corp.***
***The Texas Co.***
***Three G. Distillers***
***Tidewater Associated Oil Co.***
***Trubec Laboratories, Inc.***
***Union Carbide & Carbon Corp.***

# SAFETY...

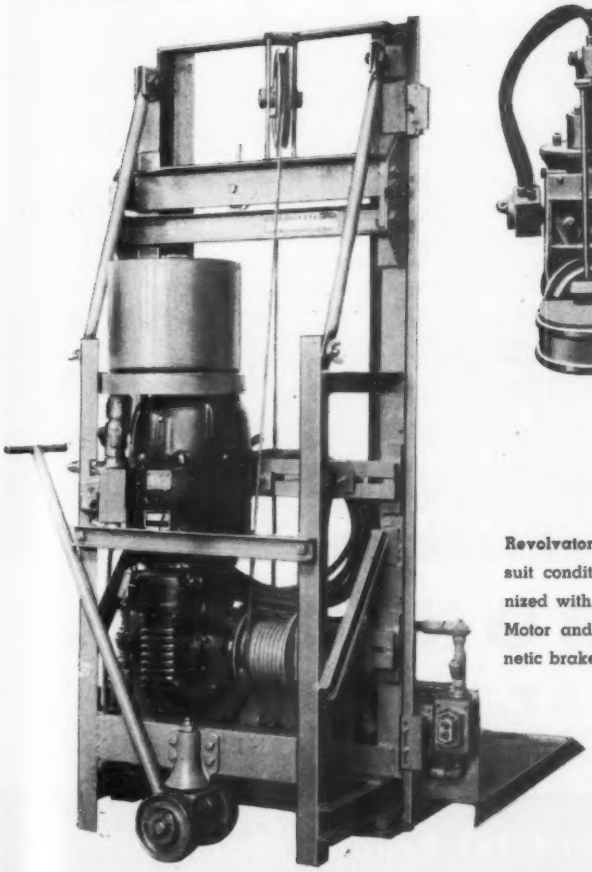
## with REVOLVATOR®

**POWER** OPERATION

## MATERIALS HANDLING EQUIPMENT

*Setting new standards for safety, the Revolvator Co. power-operated materials handling equipment shown here incorporates the careful use of non-ferrous metals for wheels, sheaves, platform rollers, pawls, brakes, governors, in addition to special other features required by application. Electrical fittings are fully protected. All switches and motors are encased by screw-on housings containing a minimum of 5 threads with all wires carried through metal conduits and explosion-proof metal boxes.*

**Driver-operated Go-Getter® Power Lift Truck for hazardous locations. Full explosion-proof construction, capacities up to 6000 lbs., depending on type. Forward and reverse 2 speed controls.**



**Revolvator Portable Elevator, Explosion-Proof Model. Platform to suit conditions, full safety details, reversible switch synchronized with brake and control. Obtainable in varying capacities. Motor and herringbone-worm gear drive combined with magnetic brake and cable drum all in one unit.**

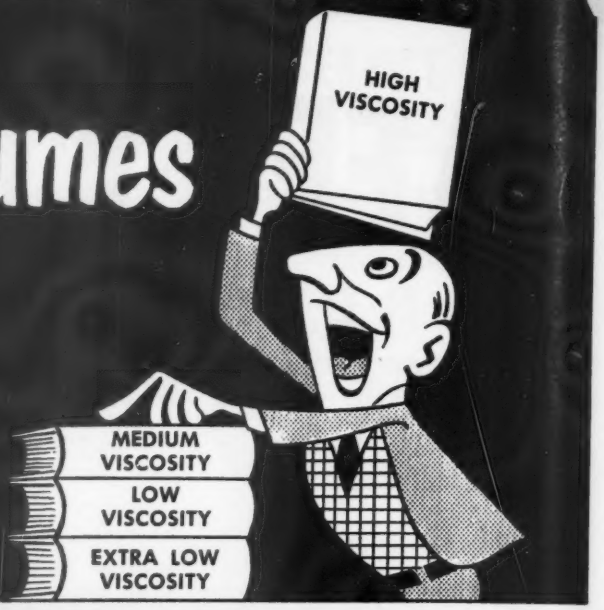
**REVOLVATOR CO.**
8703 Tonnele Ave., North Bergen, N. J.

# Speaks Volumes

for every

Paint

Formulation




# Marbon® "9200"

*Soluble High Styrene Paint Resins*

## Four Individual Viscosity Grades Permit Greater Manufacturing Flexibility

Every paint manufacturer can expand his operation without expanding his cost when he uses Marbon "9200". The wide range of viscosity-grades permits the same equipment to be used for the simple manufacture of finishes for stucco, cement and concrete block walls; cement floors; swimming pools; plaster walls; traffic paints; fast-dry lacquers; metallic finishes; maintenance paints and interior enamels.

Use Marbon "9200" HV for low vehicle solids at higher viscosity.

Use Marbon "9200" MV and LV for general use.

Use Marbon "9200" LLV for high vehicle solids at lower viscosity.

GET THE FACTS — *Write* TODAY FOR TECHNICAL LITERATURE

Marbon

## MARBON CORP.

GARY, INDIANA

SUBSIDIARY OF BORG-WARNER

MARBON . . . Your Buy-Word for Product Perfection

# NEWS

### Amsco Opens Memphis Office

The opening of an American Mineral Spirits Company office in Memphis, Tennessee was announced by E. M. Toby, Jr., President. Robert L. Moore, Jr., Manager of Amsco's new office in the Columbian Mutual Tower Building in Memphis. The Memphis location provides better industrial coverage for Amsco's complete line of technical naphthas and extraction solvents.

R. L. Moore, Jr.

Amsco's Mid-South Division under Robert L. Moore, Jr. serves the states of Mississippi, Alabama, Louisiana, Missouri, and portions of Florida in addition to Tennessee.

•

### Pigment Club Announces Program For Future Meetings

The New York Pigment Club was founded in October 1953 in response to a long-felt need for an organization of the technical employees of the pigment industry.

Membership was extended not only to chemists, engineers, technicians and sales representatives of pigment manufacturers, but also to technicians of the pigment-consuming industries, raw material suppliers, and trade publications. No restrictions have been placed on membership providing the by-laws of the club are adhered to. The organization consists of 75 members representing 38 firms.

Program for the next four meetings are as follows:

Oct. 14: A. F. Knoll, Metal Disintegrating Co., "Metallic Pigments."

Nov. 10: L. S. Pratt, General Aniline & Film Corp., "Organic Pigments."

Dec. 9: I. C. Clare, C. K. Williams & Co., "Iron Oxide Pigments."

Jan. 15, 1955: Annual Meeting, election of officers, and dinner-dance.

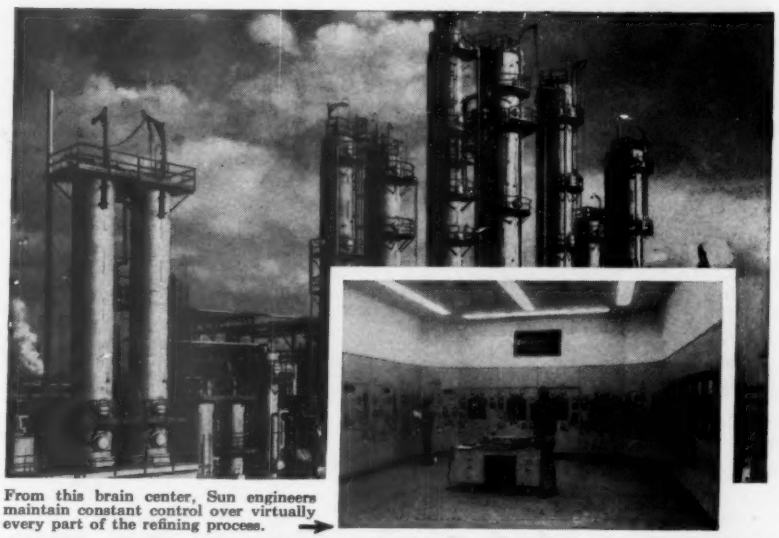
Those desiring to attend the meetings or to join the club are urged to contact Emil Wich of General Dyestuff Corp., 435 Hudson St., New York, N. Y.

### New Lab Structure of Am. Can Co. Half-Built

The American Can Company's Research and Development Center, scheduled to take its place as a new Barrington, Ill. landmark early next year, has reached the approximate mid-point in its construction schedule. Steelwork has been completed and contractors are moving ahead with installation of the roof over the 102,000-square-foot structure, reported Dr. Roger H. Lueck, Canco's general manager in charge of research and development.

Dr. Lueck pointed out that the start of roofing operations at the laboratory site has now made it possible to install the first of several items of basic equipment, including two 400-horsepower oil-fired boilers, a 375-ton air conditioning unit, and auxiliary equipment for test-rooms which will be capable of maintaining temperatures ranges from minus 20 degrees to 135 degrees Fahrenheit.

Throughout the interior of the building, maximum emphasis has been placed on achieving an environment conducive to scientific work. Facilities for conferences and meetings will include a system of folding panels which will permit large conferences to have direct access to a built-in sound system and slide-projector, or optionally, permit several small conferences to be held simultaneously in complete privacy. Adjacent to the main entrance of the building, a special assembly-area has been provided for the use of visiting scientists, technicians and student groups.

From this brain center, Sun engineers maintain constant control over virtually every part of the refining process.

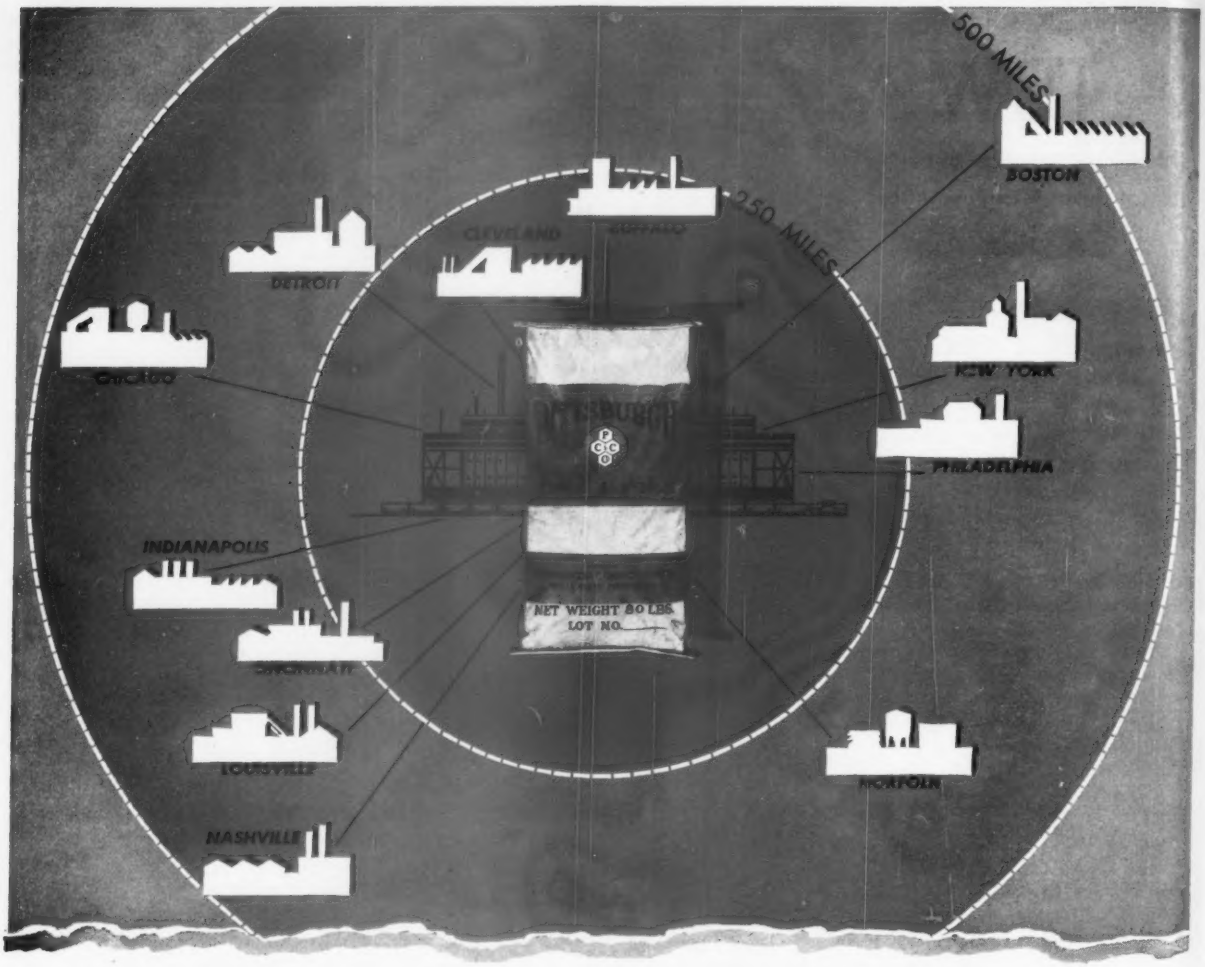
SUN OIL'S NEW PLANT NOW OFFERS
TOLUENE AND XYLENES
OF CONSTANT UNIFORMITY

Used as solvents in enamels, varnishes and industrial finishes, these new, constantly uniform Sun aromatics help you hold your finished products to close specifications—even over long-run production.

Toluene and xylenes are among the important petrochemicals now being made as primary products—not by-products—at the new Sun Oil Co. plant in Marcus Hook, Pa. This is the largest plant on the East Coast extracting these aromatics from petroleum. Precision instrumentation, combined with the most modern available facilities, provides constant control of every step in the refining process to maintain new high standards of uniformity.

For complete information on these new paint and varnish solvents, write Dept. PV-10

INDUSTRIAL PRODUCTS DEPARTMENT
SUN OIL COMPANY
SUNOCO
PHILADELPHIA 3, PA. • SUN OIL COMPANY LTD., TORONTO & MONTREAL
*Refiners of famous High-Test Blue Sunoco Gasoline*




# In Phthalic Anhydride PITTSBURGH is

## *Basic in Location, too!*

IF YOU want faster shipments and better inventory control of your phthalic anhydride, remember this: Pittsburgh is practically dead center on any map of America's great industrial heart area. So whatever your location—near Louisville or Buffalo, Chicago or Boston, you can count on practically 24-hour shipment of flake or molten P.A. from our Neville Island plant.

And here's another advantage worth considering. In one, completely integrated production cycle, Pittsburgh Coke & Chemical *quality-controls* every step of our basic production from coal to phthalic anhydride. You benefit by maximum P.A. purity, low color value and uniformly low maleic anhydride content. ● We'll be glad to send you samples or technical data and assistance. *Call or write us today.*

WAD 4952

Ammonium Sulphate
Benzene meta, para-Cresol ortho-Cresol
Naphthalene Phenol Phthalic Anhydride
alpha-Picoline beta, gamma-Picoline
Hydrochloric Acid Isonicotinic Acid
Pyridine
Toluene Xylene Xylenol
Sulphuric Acid—66° and Oleum

COAL CHEMICALS DIVISION
**PITTSBURGH**
**COKE & CHEMICAL CO.**
Grant Building • Pittsburgh 19, Pa.

COAL CHEMICALS • AGRICULTURAL CHEMICALS • FINE CHEMICALS • PROTECTIVE COATINGS • PLASTICIZERS • ACTIVATED CARBON • COKE • CEMENT • PIG IRON

# NEW MATERIALS & EQUIPMENT

A MONTHLY MARKET SURVEY

**This section is intended to keep our readers informed of new materials and equipment. While every effort is made to include only reputable products, their presence here does not constitute an official endorsement.**

DOW CORNING

### SILICA

**Flatting Agent or Extender**

"Silica soot", an almost chemically pure silicon dioxide with a particle size of only 10 to 20 millimicrons is being produced semi-commercially for the first time in this country.

According to the producer, the individual particles of this material are well defined and non-agglomerating, permitting the material's remarkable surface area and oil absorption properties to realize maximum effectiveness. It is easily dispersed in elastomeric compounds and in solvent, oil, or water-based systems. Recommended as a flatting agent and extender for protective coatings.

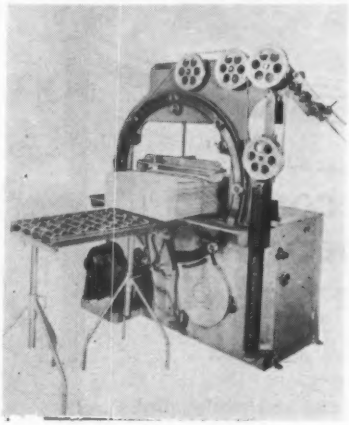
For sample and literature, write to Dow Corning Corp., Midland, Mich.

### SILICONE RESIN

**For Heat-Resistant Coatings**

Designated SR-111, this silicone resin is said to combine outstanding heat resistance with an excellent balance of cure speed, flexibility and hardness. According to the manufacturer, this resin may be used alone or may be modified with organic resins in the formulation of heat- and weather-resistant protective coatings for smokestacks, ovens, incinerators, exhaust manifolds, space heaters, and jet engine components. Other features claimed: are initial gloss and gloss retention (tests show that colored formulations based on SR-111 show no color change and retain most of their initial gloss for more than 10 weeks at temperatures up to 500 deg. F. on both steel and aluminum); good compatibility of SR-111 with organic and with other silicone resins makes it suitable for use in both colored and aluminum finishes.

For complete information on this silicone resin, write to the Silicone Products Dept., General Electric Co., Waterford, N. Y.



INLAND WIRE

### TYING MACHINE

**Automatic Type**

All adjustable mechanism, this tying machine is designed and positioned to allow maximum work space. The wire twisting unit is easily accessible for quick adjustment. Wire tension is mechanically controlled. Automatic pusher feeding can be adapted to this machine to further its efficiency on certain types of work. Maximum tying speed is 24 ties per minute.

Inland Wire Products Co., 3947 South Lowe Ave., Chicago 9, Ill.

### INSPECTION LAMP

**Varied Uses**

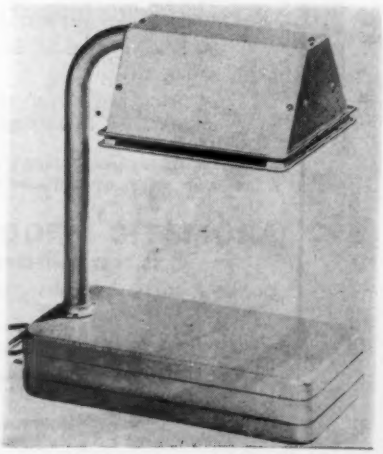
"Black-Ray", model 3X-4 lamp is of improved design for use in difficult inspection procedures, in flaw detection, control, processing, etc.

Because fluorescence due to activation by long wave ultra-violet (commonly called black light) is caused by energy of shorter wave lengths than those in the visible spectrum, it requires a much more optically correct source and reflector than is found in conventional fixtures.

The fact that over 3000 substances are activated by invisible ultra-violet black light so they glow or fluoresce in different shades and colors, is the basis for this new faster method known as "fluorescent inspection." These substances may be "naturally" fluorescent, such as oils, mould, and other types of contamination, or they may take the form of tracer pastes, or powders, lacquers, invisible inks, water or oil-soluble additives, and other substances to be integrated with present materials in varying proportions.

Ultra-Violet Products, Inc., South Pasadena, Calif.

ULTRA-VIOLET



NEW MATERIALS — EQUIPMENT

### PULP COLORS
**For Latex Emulsion Paints**

Line of "Stir-In" pulp colors is recommended for use in latex emulsion paints of all types.

According to the manufacturer, these pulp colors are homogeneous mixtures of pigment and water which will not settle out during normal storage. They are designed for cases where it is desired to save the cost of grinding the pigment or where grinding facilities are not available. The manufacturer reports that latex emulsion paints can be made satisfactorily with these pulps by means of a simple slow-speed paddle type mixer or a high speed propeller type agitator. They are recommended for pigmentation of all types of emulsion finishes, and have been used with butadiene-styrene, polystyrene, acrylic, and polyvinyl acetate polymers.

Line includes three types of Hansa Yellow (10G, G and M shades), Toluidine X Red, Naphthol Red Light, Alizarine Red, Pigment Green B and Phthalocyanine Blue. These pigments have been chosen because they are low cost, have desired good light resistance, hiding, alkali stability and other properties as well as the proper shades. They contain only enough surface active agent to aid in wetting the pigment and dispersing it into the emulsion vehicle. Therefore, they will not affect washability of the final paint according to the producer.

Samples of these pulp colors and technical information are available from the Pigment, Color and Chemical Div., The Sherwin-Williams Co., 100 Park Ave., New York 17, N. Y. or 300 W. Lake St., Chicago 6, Ill.

**That's all it costs to remove the odor from your paint with Maskit #2**

- Makes your paint more acceptable to painters *and* home owners.
- Masks the odor in the can and while paint is being applied . . . as well as during — and after — the drying period.
- Does not affect drying time or color durability.
- Amazingly economical . . . use 1 lb. of Maskit #2 to 150 gallons of paint.

*MASKIT #2 is equally effective in paints, lacquer thinners, varnishes and other similar types of products.* ***Order a trial pound today!***

**AROMATIC PRODUCTS, INCORPORATED**
**15 EAST 30th STREET, NEW YORK 16**
CHICAGO • DALLAS • MEMPHIS • PITTSBURGH • LOS ANGELES • BOSTON

PROTECTOSEAL

### STORAGE CABINET
**For Flammable Liquids**

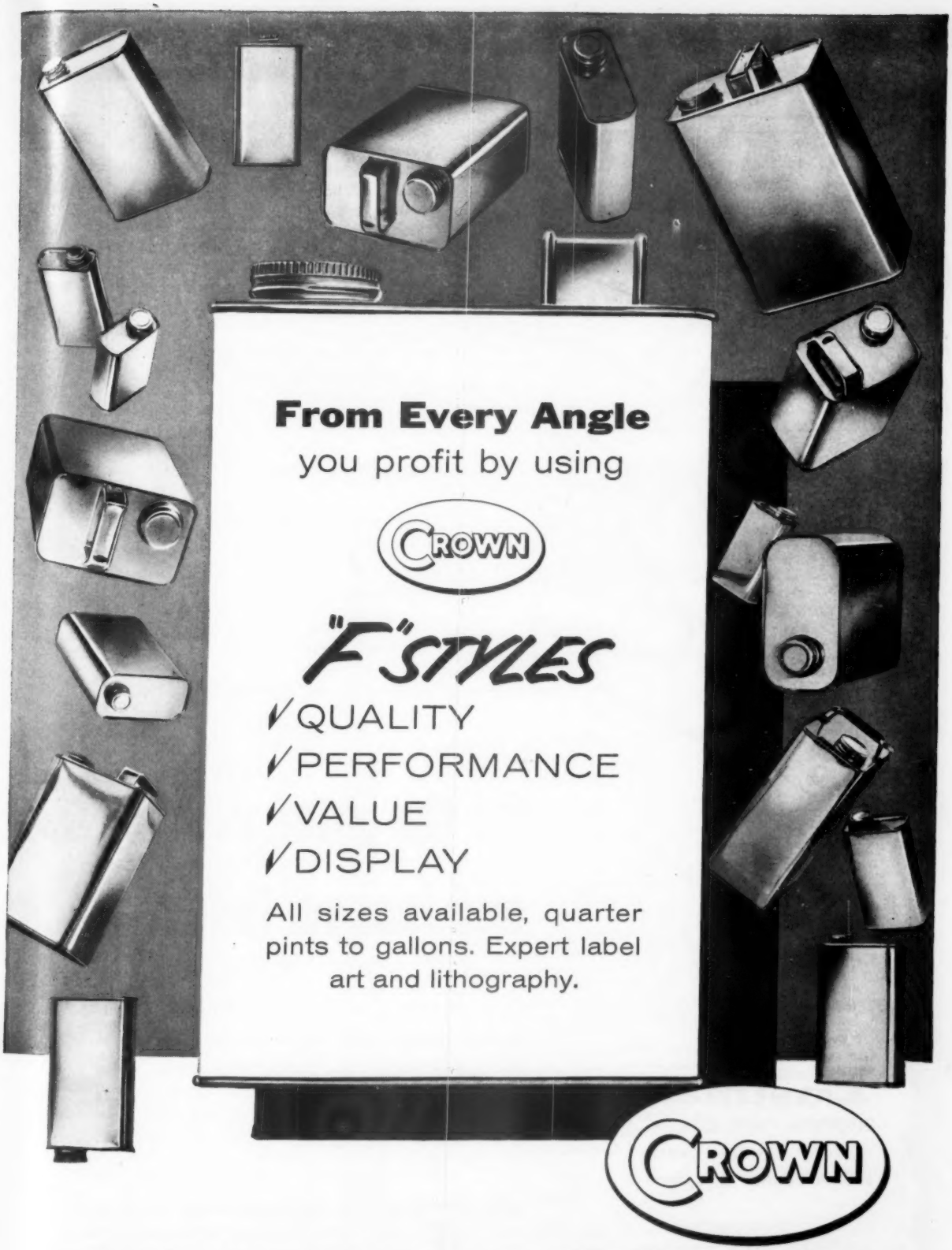
Designed in accordance with the specifications as outlined by the National Board of Underwriters, and the National Fire Protection Assoc., this cabinet is said to provide safe overnight or week-end storage within the plant for flammable liquid production and supply cans.

Cabinet provides storage of 45 gallons, is of steel construction. The doors are equipped with a spark-proof 3-point lock with key and all closure contact points are non-sparking. Provision has been made for vapor venting when this is desired.

The Protectoseal Co., 1920 S. Western Ave., Chicago, Ill.

### FAST DRYING ALKYD
**For Low-Cost Finishes**

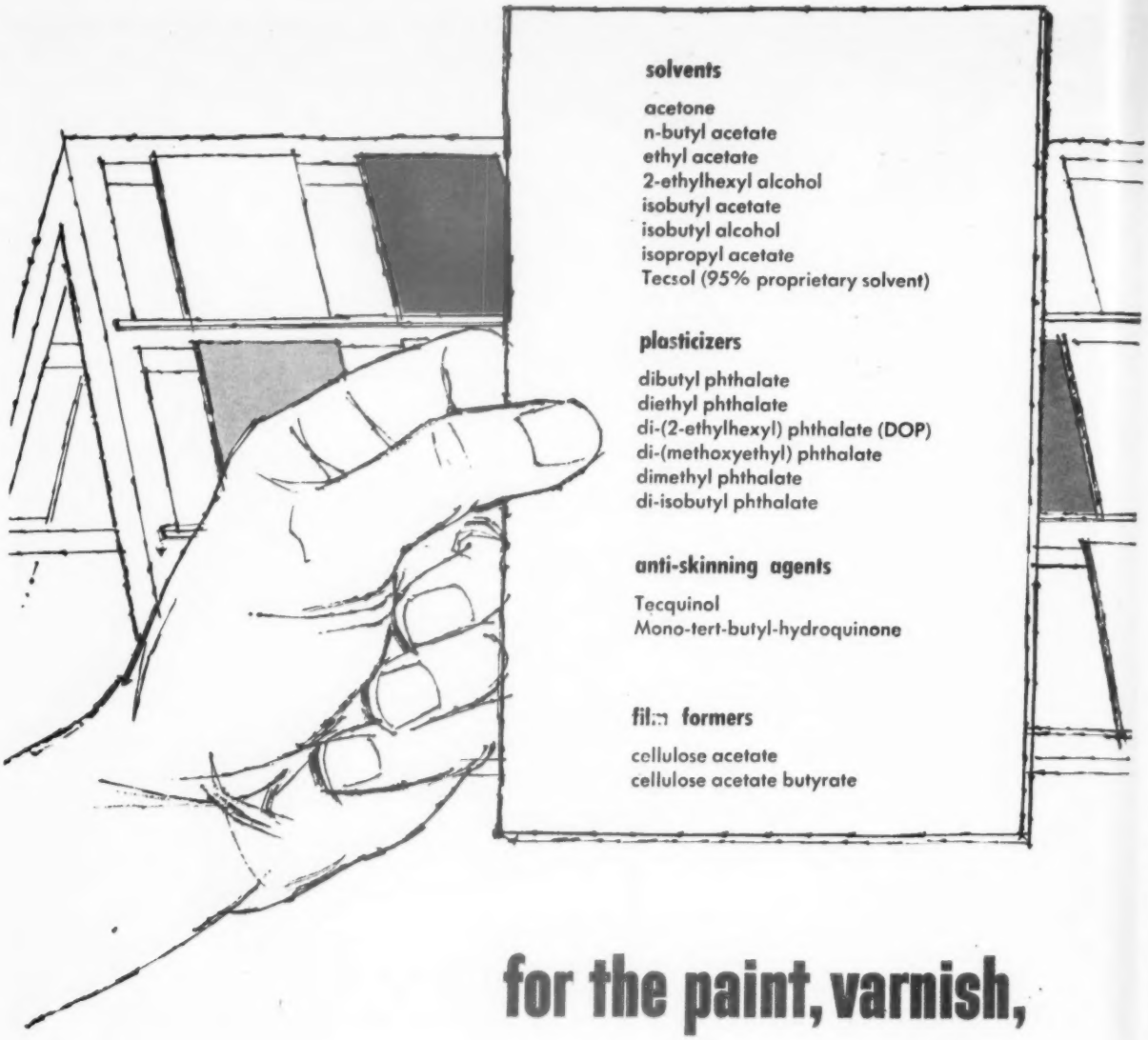
"Rezyl 750-17" is a tall oil modified alkyd solution in VM&P naphtha recommended for the production of low cost, fast air drying and baking finishes. It is said that this particular resin is a good dispersing medium and produces enamels of high gloss and fullness.




*One of America's Largest Can Manufacturers*

**CROWN CORK & SEAL COMPANY, INC.**
**CROWN CAN DIVISION**

PHILADELPHIA • CHICAGO • ORLANDO • NEW YORK • BALTIMORE • BOSTON • ST. LOUIS



**solvents**

acetone
n-butyl acetate
ethyl acetate
2-ethylhexyl alcohol
isobutyl acetate
isobutyl alcohol
isopropyl acetate
Tecsol (95% proprietary solvent)

**plasticizers**

dibutyl phthalate
diethyl phthalate
di-(2-ethylhexyl) phthalate (DOP)
di-(methoxyethyl) phthalate
dimethyl phthalate
di-isobutyl phthalate

**anti-skinning agents**

Tecquinol
Mono-tert-butyl-hydroquinone

**film formers**

cellulose acetate
cellulose acetate butyrate

# for the paint, varnish, and lacquer industry

Stocks of most of these Eastman industrial chemicals are carried in the larger industrial centers of the United States. For further information, write or call our nearest sales office.

**Eastman**
CHEMICAL PRODUCTS, INC.
KINGSPORT, TENNESSEE
Subsidiary of EASTMAN KODAK COMPANY

**SALES OFFICES: Eastman Chemical Products, Inc.,** Kingsport, Tenn.; New York—260 Madison Ave.; Framingham, Mass.—65 Concord St.; Cincinnati-Carew Tower; Cleveland-Terminal Tower Bldg.; Chicago—360 N. Michigan Ave.; St. Louis—Continental Bldg.; Houston—412 Main St. **West Coast: Wilson Meyer Co.,** San Francisco—333 Montgomery St.; Los Angeles—4800 District Blvd.; Portland—520 S. W. Sixth Ave.; Seattle—821 Second Ave.

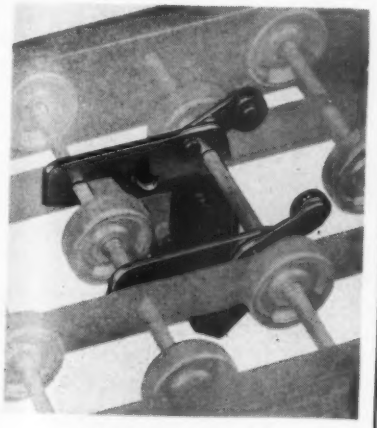
These enamels may be reduced as desired with aliphatic solvents.

A typical rutile $TiO_2$ enamel formulated at a ratio of 70 parts of pigment to 100 parts of non-volatile resin by weight and reduced with mineral spirits will dry dust free in 10-15 min., set to touch in 1½ hr., tack free in 3½ hr. and have a good overnight hardness. Good cure and mar-proofness is obtained with a baking schedule of 10-20 minutes at 250-275 deg. F., according to the manufacturer.

This tall oil alkyd resin is said to be completely compatible with medium and long oil alkyds; has good compatibility with oils and oleoresinous varnishes; and is compatible with certain amino resins.

Suggested uses include low cost industrial finishes, drum enamels, toy enamels, etc.

American Cyanamid Co., Plastics and Resins Div., 30 Rockefeller Plaza, New York 20, N. Y.



RAPIDS-STANDARD

### CASE COUNTER

**Inexpensive**

Case counter provides accurate automatic check of the number of cartons that have passed over a section of gravity wheel conveyor. This case counter fits the firm's 12-RS-6 or 12-RS-10 gravity wheel conveyor without rearrangement of wheels or on other models of 12" or 18" wide wheel conveyor by removing or rearranging one or two wheels. Unit counts up to 99,999, then starts over.

Rapids-Standard Co., Inc., 342 Rapistan Bldg., Grand Rapids 2, Mich.

### ALKYD RESIN

**With Improved Properties**

"Glyptal" alkyd resin, G-E 7310, is said to have the following properties: weather resistance, mar-resistance, toughness, good flexibility, long color life, high gloss retention, wide, P.V.C. range, and wide resin compatibility. The manufacturer recommends this alkyd in the formulation of finishes for new cars, trucks, office machines, metal kitchen cabinets, tractors and farm equipment.

General Electric Co., Chemical Div., 1 River Road, Schenectady, N. Y.

### FORK TRUCK

**Lightweight**

Lightweight fork lift truck is designed to work in and out of motor transports and on congested loading docks. According to the manufacturer, this truck features four-wheel suspensions as well as a low center of gravity for greater stability and safety. Has rated capacity of 1,000 to 3,000 pounds. Operating controls are located in the rear allowing the operator easy accessibility from either side of the truck.

Automatic Transportation Co., 149 W. 87th St., Chicago 20, N. Y.

Chats about Finishes

PROTECTIVE COATINGS LAB
BUSY BUT READY TO HELP

*by*

RUFUS F. WINT

*Coordinator—Coatings Laboratory*
*Hercules Cellulose Products Dept.*

The Hercules Cellulose Products Coatings Laboratory was organized to provide more and speedier technical service to the protective coatings industry. It has been swamped with work since its inception. All new work must be carefully screened to insure: (1) the selection of the most important jobs, and (2) fast service on these jobs.

An example of work done in this laboratory was *Staining of Lacquer Films by Rubbing Oils* (Request S-54-14). A furniture lacquer manufacturer submitted eight of his customers' rubbing oils to determine whether these oils used for rubbing and polishing furniture tended to stain lacquer finishes.

This job was readily approved. Why? Because it was thought the solution of this problem would help our customer and would help the lacquer industry by upgrading lacquer furniture finishes.

The results of the laboratory work undertaken showed that four of the oils, those not being highly refined, did have a tendency to stain furniture lacquers, while four more highly refined oils tested in an identical manner, did not stain.

The Coatings Laboratory, its staff and facilities, are eager to serve the protective coatings industry. Don't hesitate to discuss your problems with us.

Rufus F. Wint

*Cellulose Products Department*
HERCULES POWDER COMPANY
INCORPORATED
*926 Market St., Wilmington 99, Del.*
IC54-6

DOW

# FIELD TEST PROVES DOW LATEX 512-K EXCELLENT FOR EXTERIOR PAINTS

## Paint made with this DOW latex was applied on the home below... is still in top condition after twenty-two months

In November, 1952, paint formulated with Dow Latex 512-K was put on this California home. The paint was applied over both wet and dry surfaces by both brush and roller. A recent study of the paint surface shows no noticeable change in appearance, an almost perfect film integrity and no apparent paint failure! Dow Latex 512-K again proved to be exceilent for use in exterior stucco and masonry paints.

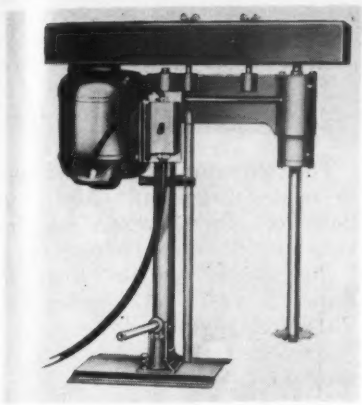
For five years Dow has been making many field tests as well as laboratory tests on exterior masonry paints formulated with Dow Latex 512-K. Invariably these paints have proved to be particularly durable. They have also proved to be easily applied and quick-drying.

If you are planning to modernize your paint line with an exterior masonry paint, contact Dow right away. Dow is a pioneer in the development of synthetic materials for better paints, and offers you a wealth of information, including a bulletin "Dow Latex 512-K for Exterior Masonry Paints". THE DOW CHEMICAL COMPANY, Midland, Michigan, Plastics Sales PL 489F.

*you can depend on DOW PLASTICS*

DOW

NEW MATERIALS — EQUIPMENT



COWLES

## LABORATORY DISSOLVER

**For Small Batches**

Laboratory dissolver is designed for small scale production work. Known as the Cowles Model 1-VT, this unit is 30 inches high and is equipped with a hand operated hydraulic lifting device that raises it to a maximum of 44 inches. Impeller sizes of 3, 3½, and 4 inches in diameter are supplied as standard equipment. This unit uses a 1 hp motor.

The manufacturer claims that results of experiments with the lab machine will be reproducible in production work. This dissolver can also be used for production batches up to 5 gallons in solution or dispersion situations where production requires small, intermittent use of high dissolving equipment.

For complete details on this dissolver, write to the Cowles Co., Inc., Cayuga 1, N. Y.

## TEMPERATURE REGULATOR

**Varied Uses**

The 999 regulator is used to control temperature of internal combustion engines, storage water heaters, and for industrial processes requiring accurate temperature control, particularly in the chemical field.

This unit is self-powered, and requires no compressed air, electricity or other outside source of energy. Over-temperature protection is said to be a standard feature.

Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.

## AUTOMATIC TITRIMETER

**Saves Time**

According to the manufacturer, this automatic titrimeter permits titration data to be obtained in about one minute as compared to a minimum of 2-3 minutes for the average titration by hand.

This titrimeter operates with the same extreme sensitivity as the manual unit: a change at the endpoint of only 20 millivolts completely opens or shuts the electronic indicator eye (that is, a fraction of a drop of 0.001 N NaOH solution.

Fisher Scientific, 717 Forbes St., Pittsburgh 19, Pa.

## FIRE-FIGHTING CART

**Eliminates Lifting**

Fire extinguisher cart is a device for stationing various combination of dry chemical, carbon dioxide and vaporizing liquid type of extinguishers at their strategic locations and for transporting them easily to the scene of the fire in the quickest possible time. It permits one person to move 3 extinguishers alone. This mobile unit is handy for holding extra extinguishers for standby protection during operations that create fire risks.

American-LaFrance-Foamite Corp., Elmira, N. Y.

You Can Make All These Water-Base Paints with

ELVACET*

POLYVINYL ACETATE EMULSIONS

...and Du Pont will help you with your formulations

You can make a variety of low-cost, durable paints with "Elvacet" polyvinyl acetate emulsions. Primer-sealer, interior and exterior masonry paints can all be formulated with "Elvacet", without special mixing equipment.

Your water-based paints, properly formulated with "Elvacet", will offer these sales advantages:

- Easy to apply
- Fast-drying
- Resist fading and yellowing
- High moisture-vapor transmission—(Paints can "breathe")
- Easy to clean
- Alkali-resistant

Your customers will like the way "Elvacet"-based paints are easily washed from brushes and hands when the job is done—no messy clean-up problem.

Get more information on "Elvacet" and its use in this growing paint field. Just fill out and mail the coupon below.

*REG U S PAT OFF.

ELVACET
Reg. U. S. Pat. Off.
polyvinyl acetate emulsions
DU PONT
Better Things for Better Living ... through Chemistry

E. I. du Pont de Nemours & Co. (Inc.) PVP-104
Electrochemicals Dept., Wilmington 98, Del
☐ Please send me more information on "Elvacet" for interior and masonry paints.
☐ Please have your representative call with suggested formulations.
Name_____ Position_____
Firm_____
Address_____
City_____ State_____

NEW
MATERIALS — EQUIPMENT

### CALIBRATOR ATTACHMENT
**For Sub-Sieve Sizer**

Sub-sieve sizer is an instrument that measures particles too small for sieves (range: 0.2 to 50 microns) by determining the resistance to air-flow of a weighed sample under standard packing conditions.

A motor-driven air pump builds up a regulated constant pressure, sends a steady flow of dry air through the packed sample. By two simple expedients—always using equal-volume samples, and observing the degree of packing—

FISHER

variables such as porosity and voids are automatically compensated for in the chart on the instrument. This is said to eliminate all computation. In fact, the operator need merely set the calculator pointer at the liquid level of the manometer and read the particle size directly in micron units from the chart.

The calibrator permits operators to relate their data directly to those of other workers and to keep a check on the instruments.

For further details, write to Fisher Scientific 717 Forbes St., Pittsburgh 19, Pa.

### MODIFIED WAX
**Additive for Varnishes**

"Polymekon Wax", a chemical modification of microcrystalline wax, has the ability to form films, according to the manufacturer. Because of this characteristic, it is recommended as an additive in the manufacture of waxed paper, varnishes, lacquers, rubber compositions, printing inks, electrical insulating compounds, and paste polishes.

Warwick Wax Co., Inc., subsidiary of Sun Chemical Corp., 10th St. and 44th Ave. Long Island City, N. Y.

### VERTICAL LIFT
**Platform Type**

Vertical lift electric platform hoist is designed for moving materials vertically between floors or from one elevation to another.

This unit is available with a platform for use within one floor; with a cab for mounting in a hoistway for between—floors use; or equipped to lift and lower materials between levels of a gravity or power conveyor system.

Known as the Rapistan VL, this unit is available with a choice of lift speeds with either 250 or 500 pounds capacity. The company claims that this unit complies with the American Standard Safety Code for elevators.

Upper and lower limits of platform travel are adjusted by positioning micro switches at the desired points on the carriage frame.

The Rapids-Standard Co., Inc., 342 Rapistan Building, Grand Rapids, Mich.


H. KOHNSTAMM & CO. INC.

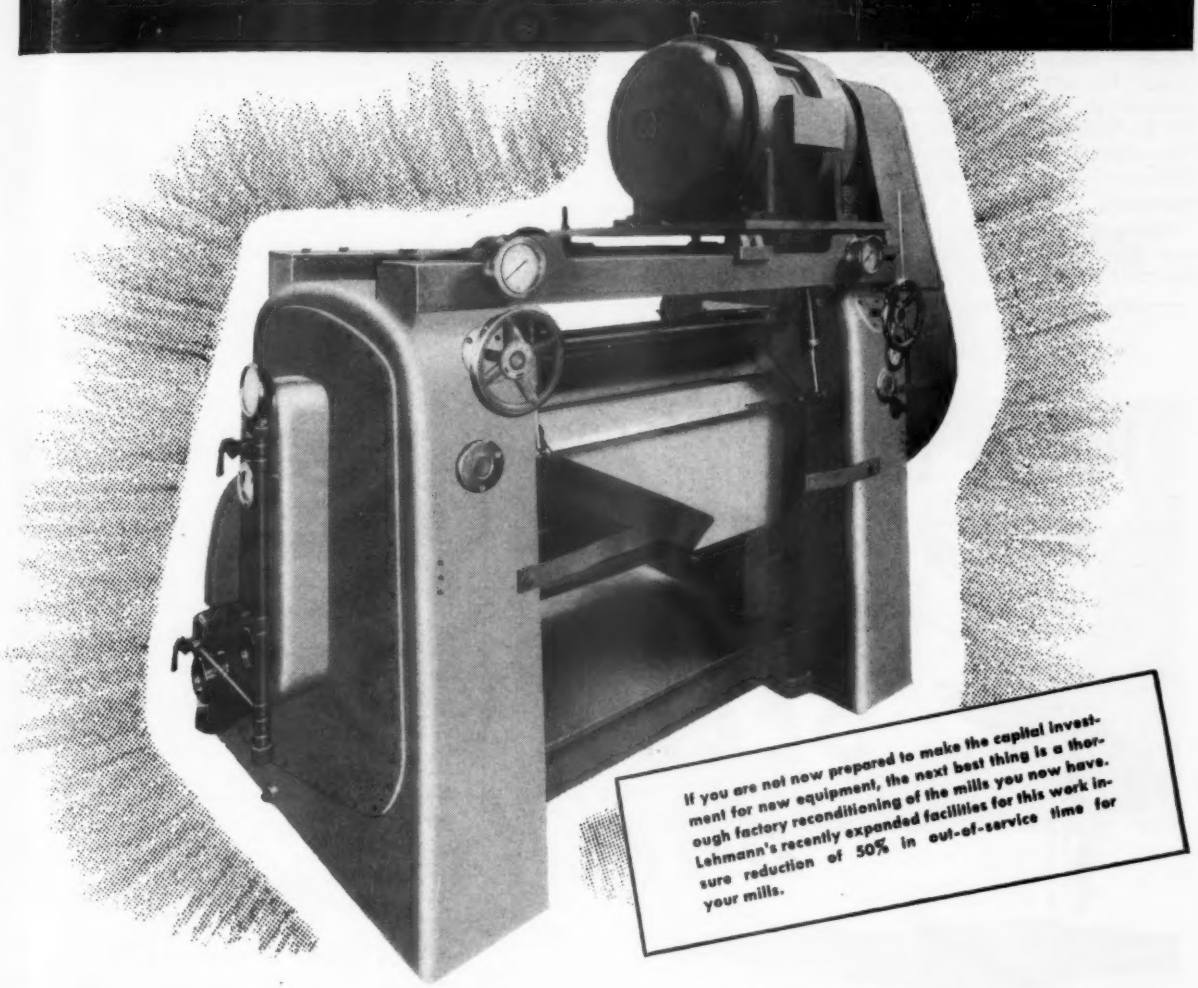
A 6460
STANDARD-CHLORINATED
BLAZING RED TONER
*Light-fast • Clean and Brilliant*
SOFT-GRINDING
Excellent for interior or exterior use

B 409
CHLORINATED
SUNSET RED TONER
(ORANGE UNDERTONE)
A strong, soft-grinding color with good hiding power

***Why not check for yourself by writing for a test sample***

ESTABLISHED 1851
KOHNSTAMM & CO., Inc.
89 PARK PLACE, NEW YORK 7 • 11-13 E. ILLINOIS ST., CHICAGO 11
4735 DISTRICT BLVD., LOS ANGELES 11

# *More production in the same floor area?*
# It can be done *with* LEHMANN PAINT MILLS



If you are not now prepared to make the capital investment for new equipment, the next best thing is a thorough factory reconditioning of the mills you now have. Lehmann's recently expanded facilities for this work insure reduction of 50% in out-of-service time for your mills.

Many paint manufacturers will soon be faced with the problem of boosting production to meet customer requirements, without increasing plant size. To some this may seem an impossible achievement—but is not. New machinery is available that can increase output per unit of space enormously.

The Lehmann Model 631-V Sight-O-Matic* Three Roll Paint Mill is such a machine. It gives a quality grind at an extremely high rate of production straight across the board—no matter what the formula. Users are amazed to find that each new Model 631-V Mill will accomplish as much as several of their older types.

As a companion unit to this mill we offer the Model 450 M Heavy Duty Twin Paste Mixer.

***Send for complete information and prices.***

*Reg. U. S. Pat. Off.

LEHMANN®

## J. M. LEHMANN COMPANY, Inc.

MAIN OFFICE AND FACTORY: 558 NEW YORK AVE., LYNDHURST, N. J.

## Personnel Changes

### KRYLON

**Emory S. Todd** has been appointed manufacturer's representative. He was formerly vice-president in charge of sales. He will cover the hardware, commercial, marine, graphic arts and TV-Radio-Electronics fields in eastern Pennsylvania, southern New Jersey, Maryland, Delaware, Virginia and D. C.

### NUODEX

**Bernard Reiter,** formerly controller, was elected treasurer, at the recent Board of Directors meeting.

### WITCO

**Joseph J. Tumpeer** has been appointed senior vice-president, directing the company's Pioneer Asphalt division, according to a recent announcement. He has been affiliated with the company since 1921, and served initially in the Chicago office, and later was appointed vice-president and general manager of the Pioneer Asphalt division, which has plants at Perth Amboy, N. J. and Lawrenceville, Ill. He will make his headquarters at the New York office of the company.

J. J. Tumpeer

J. H. Paden

M. Scalera

### AMERICAN CYANAMID

**Dr. Joseph H. Paden** has been appointed Director of Laboratories of the research division's Bound Brook plant. **Dr. Mario Scalera** has been appointed Director of Research.

### PITTSBURGH COKE

**Alfred J. Oxenham** has been appointed sales development manager of the coal chemicals division, according to an announcement from Henry Avery, manager.

**Richard J. Murphy** has been transferred to the New York office of the division, and **William R. Blackstock** has been appointed sales representative for the Pittsburgh and midwestern area.

### HERCULES

**W. W. Delaney** has been made manager of the eastern division of the export department; **Joseph M. Carbonara** has been appointed manager, western hemisphere division, and **Curtis M. Hinsley,** supervisor, European division, according to David M. Houston, director of the department.

### ADVANCE SOLVENTS

**Agnew A. Talcott** has been made manager of the petrochemicals sales department, according to an announcement from A. B. Mullaly, president.

### DEVOE & RAYNOLDS

**John T. McCafferty** has been appointed divisional sales manager of the eastern district of Jones-Dabney Company division, according to an announcement from Clarence W. Slocum, vice-president in charge of Newark, N. J. operation. He will supervise sales of industrial finishes. Prior to this appointment he represented the company in Wisconsin for the past six years. He is a native of Fort Collins, Colorado, where he graduated from Colorado State College, and now resides in Ridgewood, N. J.

J. T. McCafferty

• Every now and then a bad batch will go through. Maybe agglomerates were caused by faulty raw materials, or improper setting of the grind. Sometimes a run is contaminated by dirt or other foreign matter.

There's no need to throw that batch away—or ship it and hurt your reputation. You can salvage seedy batches by running them through a Cuno MICRO-KLEAN filter.

*Here's what MICRO-KLEAN does for you:*

• gives positive removal of all oversize pigments and contaminants.

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G. R. Nottingham

2 BALTIMORE, MARYLAND
W. R. McClayton & Co.

3 CHICAGO, ILLINOIS
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5 DALLAS, TEXAS
W. W. Richerson

6 DETROIT, MICHIGAN
George E. Moser & Son, Inc.

7 HOUSTON, TEXAS
Texas Solvents & Chemicals Co.

8 KANSAS CITY, MISSOURI
Ack Sales Company

9 LOS ANGELES, CALIFORNIA
California Flaxseed Products Co.

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B. H. Boyat & Co.

11 MILWAUKEE, WISCONSIN
J. W. Copps

12 MINNEAPOLIS, MINNESOTA
Horton Earl Co.

13 MONTREAL, QUEBEC, CANADA
B. & S. H. Thompson & Co. Ltd.

14 NEW ORLEANS, LOUISIANA
Russell Chemical Co.

15 NEW YORK CITY, N. Y.
Garrigues, Stewart & Davies, Inc.

16 PHILADELPHIA, PENNSYLVANIA
Baker Industrial Oils Co.

17 PITTSBURGH, PENNSYLVANIA
Emmett D. Griffin, Jr.

18 SAN FRANCISCO, CALIFORNIA
Pacific Vegetable Oil Corp.

19 SEATTLE, WASHINGTON
W. Ronald Benson, Inc.

20 ST. LOUIS, MISSOURI
Ivan T. Bauman Co.

21 TORONTO, ONTARIO, CANADA
B. & S. H. Thompson & Co. Ltd.

### REICHHOLD

**Sam Gurley, Jr.,** has joined the sales staff, according to an announcement from headquarters. He was formerly general sales manager of plastics and resins for the Barrett Division, Allied Chemical & Dye Corporation. He will act in the capacity of roving ambassador and will make his headquarters in White Plains, N. Y. His fourteen years experience in the plastics and industrial resins field, makes him ideally suited for his new post. He resides in Manhasset, Long Island.

Sam Gurley, Jr.

### 20TH CENTURY

**Sol Marburger** has been appointed to the New Jersey sales territory. He had previously represented the firm in Manhattan and Brooklyn.

### WEST VIRGINIA

**John C. Ball, Jr.** has joined the Poly-chemicals Division as technical representative. He was formerly connected with E. I. Du Pont de Nemours & Co., at their Savannah River project.

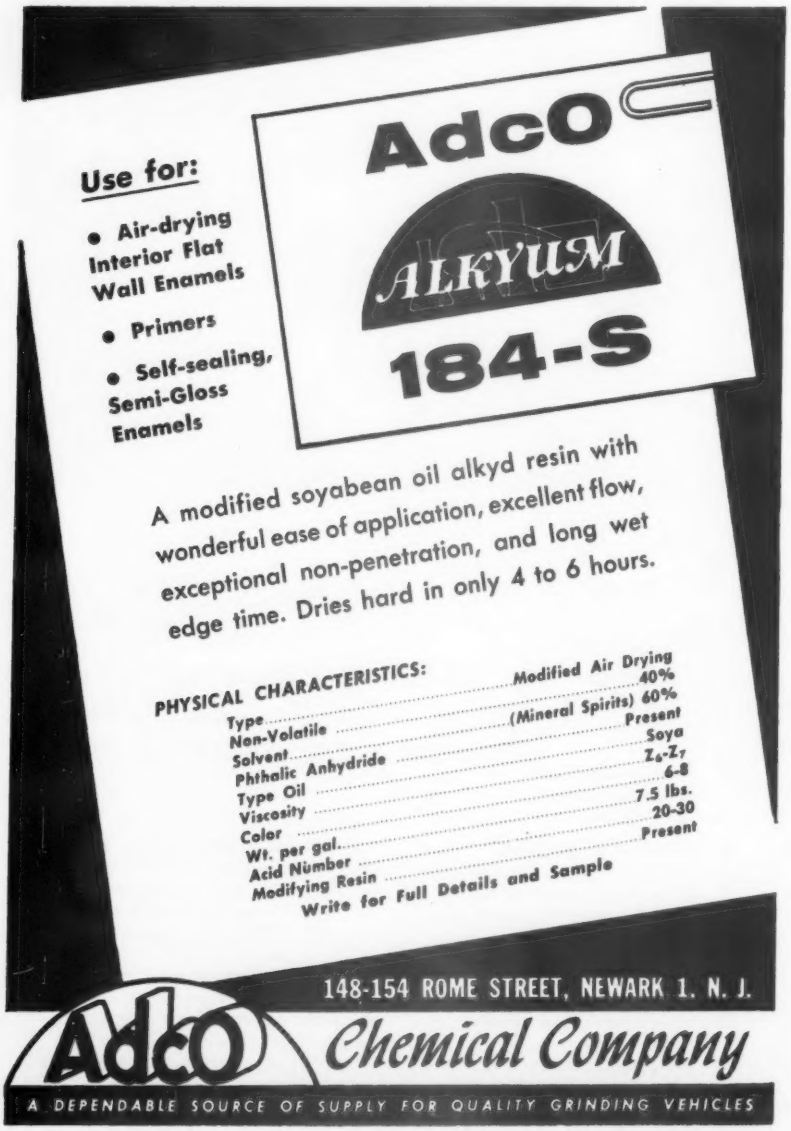
### SILLERS

**Edwin Edelstein,** paint research chemist and inventor in the field of zinc resinate resins, has been appointed chief chemist, according to an announcement from Ted Beckert, technical director of the company. He was for several years chief chemist for Benjamin Moore & Co. in their Cleveland plant.

### VULCAN STAMPING

**Donald R. Hoover** has been appointed sales representative of the metropolitan Chicago area, according to an announcement from Herbert B. Scharbach, vice-president and sales manager. He is a graduate of Michigan State College, where he majored in economics and marketing. After completion of the course he entered the Army, where he advanced to the rank of First Lieutenant. He is a member of the Junior Chamber of Commerce of Wheaton, Ill.

D. R. Hoover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Color 6-8
Wt. per gal. 7.5 lbs.
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### GOODYEAR

**Laurence E. Stanton** has been added to the Chemical Division field staff, to head up the Houston, Texas, sales territory, according to an announcement from C. A. McNeer, general sales manager. He has had previous technical and sales experience in the paint and rubber fields. He was graduated from North Park Junior College and received his BS degree in chemistry from Elmhurst College. During WW II, he was a member of the U. S. Naval Air Force.

L. E. Stanton

### SEIDLITZ

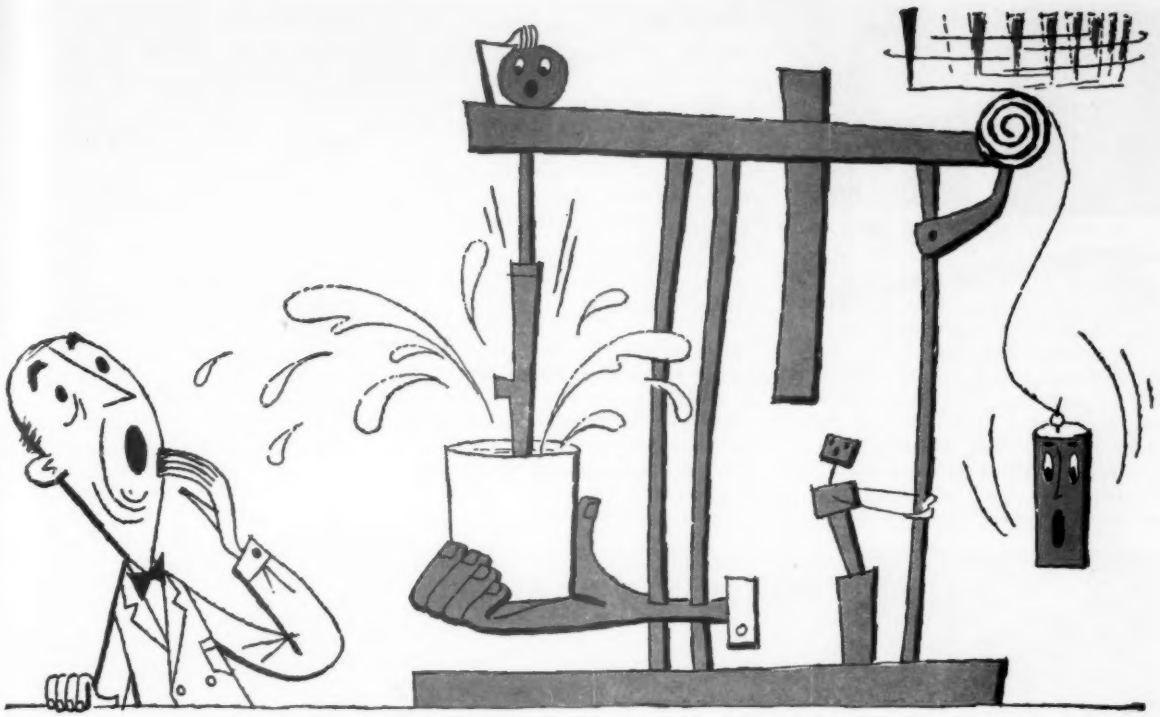
**Dr. Charles A. Coffey** has been appointed technical director, according to an announcement by G. R. Seidlitz, president. He has been associated with the protective coatings industry for the past twenty years.

### CROWN CAN

**Louis S. Frantz** has been appointed manager of customer services of the can division. He has a wide experience in the field, and had served as service supervisor in Geneva, N. Y., and Baltimore, Md., and just prior to his current appointment was district service supervisor at Baltimore.

### ALLIED CHEMICAL

**V. W. Aubel, Jr.,** has been appointed manager of the Philadelphia sales branch of Solvay Process Division, according to an announcement from H. F. Merritt, vice-president. He will cover Virginia, Maryland, Delaware, southern New Jersey and eastern Pennsylvania.



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Our Technical Service Department will be happy to guide you in your choice of titanium dioxide pigments. Titanium Pigment Corporation, 111 Broadway, New York 6, N. Y.; Atlanta 2; Boston 6; Chicago 3; Cleveland 15; Los Angeles 22; Philadelphia 3; Pittsburgh 12; Portland 9, Ore.; San Francisco 7. In Canada: Canadian Titanium Pigments Limited, Montreal 2; Toronto 1.

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TITANIUM PIGMENT CORPORATION

*Subsidiary of* NATIONAL LEAD COMPANY

A. M. Toft

A. C. Staley

## NATIONAL CAN

**Andrew M. Toft** and **Allen C. Staley, Jr.,** have been elected executive vice-presidents, it was announced by R. S. Solinsky, president. Mr. Toft has been vice-president of the company, and formerly was vice-president and general manager of Cans, Inc. Mr. Staley was previously assistant general manager of sales of the American Can Company.

## HERCULES

**Dr. W. G. Kissinger** has been appointed sales supervisor of phenol and derivitives, according to an announcement from G. F. Fogg, director of sales of Naval Stores Department. It is a newly created post, and Dr. Kissinger will be in charge of sales development work as well as sales at the new plant in Gibbstown, N. J.

## ATLAS POWDER

**Arthur G. Heinel** has been appointed technical representative of the Richmond, Va. sub-office. He was formerly at the Atlanta office, where he was succeeded by **Adrian J. Stewart,** who was associated with the chemicals department at Atlas Point, Del.

*Check these valuable features!*

- Easy rotary pumping action.
- Famous "Self-Adjusting for Wear" Design.
- Surplus liquid return eliminates spillage and waste.
- Positive displacement for positive control.
- Wide range of "plant engineered" accessories.
- Available in capacities from 7 to 28 gallons per minute.

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*See Yellow pages for your local sales representative*


## WARWICK

**Albert H. Gower** has been appointed general sales manager of this division of the Sun Chemical Corporation. He will direct the sales activities of the product groups comprising textile chemicals, pigment printing colors, plastic dispersions, industrial surfectants and metallic soaps. For the last ten years he handled various sales functions in the industrial chemicals division of the American Cyanamid Co. He was born in Boston, and was educated at the University of Massachusetts, where he received a BS in chemistry in 1931, his MS in 1934 and a Ph. D. in 1941.

A. H. Gower

## AMSCO

**Karl F. Giloth** has been appointed assistant midwest sales manager, according to an announcement by Max A. Williams, vice-president. He will handle petroleum solvents, technical naphthas and waxes in the territory that extends from western Pennsylvania to the Rocky Mountains, and will maintain headquarters in the Chicago office With the exception of two years service in WW II, he has been associated with the company since 1936, as an assistant in the traffic department, traffic manager, and in the sales department since 1946.

K. F. Giloth

## DIAMOND ALKALI

**George Rieger** has been named to lead and coordinate market research activities of the commercial development department. He was formerly assistant manager of the sales research division of Hercules Powder Company.

## HEYDEN

**Robert M. Aude** has been appointed plant manager of the Garfield, N. J. plant, according to an announcement from Simon Askin, president. He previously had been manager of the Fords, N. J. plant, and prior to that time served in various production and supervising capacities with Monsanto Chemical Co. **Edward Trio** has been appointed manager of the Fords plant, where he previously had been operating superintendent.

# Take it from the test panels

*Dutch Boy* Basic Silicate White Lead* —— **"45X"** ——→

*has what it takes to make foolproof exterior paints*

For foolproof exterior paints . . . "lead."

"No question about that," most paint makers will tell you.

"And for 'lead' at its economical best," many of the leaders add, "it's 'Dutch Boy' Basic Silicate White Lead '45X'."

They know what they're talking about, too. They've not only seen the proof in their own exterior paints . . . in a lot fewer complaints, for one thing. They've also seen it at National Lead's Sayville Test Station, where exposure tests of many different pigments have been conducted for many years.

**In white House Paints,** "Dutch Boy" Basic Silicate White Lead "45X" improves self-cleaning properties, these tests prove.

**In tinted House Paints,** it increases film durability and resistance to color changes.

**In Primers,** "45X" contributes greater adhesion, plus the water resistance to maintain the paint film's adhesive bond.

**In Porch and Floor Enamels,** it plasticizes the film, increases abrasion resistance, and improves adhesion.

All these things adaptable "45X" does even though you use fewer pounds than with other white lead types. That's because the reactive portion of each "45X" pigment particle is concentrated at the surface: thus, making available proportionately larger amounts of "lead."

Improve your exterior paints — yet save money. Standardize on "Dutch Boy" Basic Silicate White Lead "45X" in your formulations.

**National Lead Company:** New York 6; Atlanta; Buffalo 3; Chicago 8; Cincinnati 3; Cleveland 13; Dallas 2; Philadelphia 25; Pittsburgh 12; St. Louis 1; San Francisco 10; Boston 6 (National Lead Co. of Mass.).

*Reg. U. S. Pat. Off.

### VULCAN STEEL CONTAINER

**Donald W. Spurrell** has been named assistant to the president, according to an announcement from Gordon D. Zuck, president. He is a graduate of the University of Alabama with a BS in chemistry and an LLB in law. He served in the Navy during WW II. According to Mr. Zuck, Mr. Spurrell's duties will include industrial relations, production control methods and research, specializing on the full line of steel pails and rums manufactured by the company.

D. W. Spurrell

### REILLY TAR

**Robert S. Hinkle** has been appointed a member of the protective coating sales group, according to an announcement from J. H. Barnett, Jr., general sales manager. He is a recent graduate of the University of Illinois, and served with the U. S. Air Force in the European Theatre of Operations during WW II. He will make his headquarters in Granite City, Ill., where he will be associated with the group headed by E. E. Goodman, district manager.

R. S. Hinkle


Outstanding for Quality...

**WITCO-CONTINENTAL CARBON BLACKS**

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|---|---|
| **Witcoblak® No. 32** | maximum jetness at low cost |
| **Witcoblak No. 50** | standard low cost black of good color and tinting strength |
| **Witcoblak No. 55** | a new densed regular color channel black. Its high density provides a low viscosity premix and makes it less dusty to handle |
| **Witcoblak No. 100** | a medium color black used to produce a jetter color in paints |
| **Witcoblak Hitone** | next darker grade to Witcoblak No. 100 used in industrial enamels and lacquers |
| **Witcoblak F-1** | good blue tone (to replace lampblack) for tinting. The lowest cost carbon black |
| **Witcoblak F-2** | similar to Witcoblak F-1 but darker and stronger |
| **Witcoblak F-3** | high tinting strength with blue tone characteristic of lampblacks |

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**260 Madison Avenue, New York 16, N. Y.**
Chicago • Cleveland • Boston • Los Angeles
San Francisco • Houston • Atlanta • Akron • Amarillo
London and Manchester, England


### BERRY BROTHERS

**William H. Martin** has been appointed technical director of this division of the American-Marietta Company. He joined the division as chief chemist in 1948. In his new post he will supervise the automotive and industrial finishes laboratory.

### AMERICAN CAN

**C. E. Cummings** has been appointed manager of the Lemoyne, Pa., plant. **R. A. Fistere** was named plant manager in Tampa, Fla.

### DIAMOND ALKALI

**Kemble S. Lewis** has become sales manager ofthe plastics division. **Olin Smith** has been named assistant branch manager in Chicago, Ill.

### UNION CARBIDE

**Robert D. Stewart** and **Sebern G. Sellers** have joined the fine chemicals sales group, according to an announcement from R. L. Bateman, manager of the group.

### MARBON

**Richard R. Blair** has joined the corporation, a subsidiary of Borg-Warner, as a technical sales representative to cover the rubber, paint and plastic industries in Ohio, western Pennsylvania and eastern Michigan territory. He received his BS degree in chemistry from Franklin & Marshall College, and formerly was associated with Columbia Southern Chemical Corporation, Goodyear Tire and Rubber Company, and Rohn & Haas Corporation in various technical capacities. His headquarters will be at Wooster, Ohio.

### AMERICAN CYANAMID

**James W. Gilman** has been appointed sales representative in the Pacific northwest for the plastics and resins division. His headquarters will be at the company's Seattle office, and the products he will specialize on will include bonding and laminating resins, coating resins, molding materials and polyester resins. He is a graduate of the University of California, and joined the company in 1945. Prior to his joining the company he headed the laboratory of the Old Colony Paint and Chemical Company. He has been active in Production Club activities in Southern California, and is a past president of Toastmasters International Los Oredores No. 1382.

**E. B. Cordon,** in charge of the west coast technical service for coating resins, will continue to serve the San Francisco and Southern California territory.

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# DRIERS

**are guaranteed to be free of modifying agents which could** react with vehicles, pigments or other paint additives to **cause—**

**discoloration**
**"sleepy" drying**
**loss of drying power**

Produced by the first manufacturer of metal naphthenates in the U. S. A. and the only producer with its own supply of naphthenic acids in its own backyard.

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# NEWS

### Reichhold Elects Three to Firm's Board of Directors

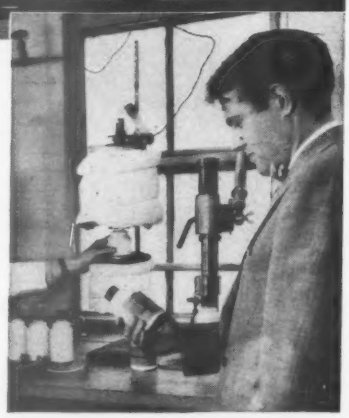
The election of F. A. Jolles, Herbert W. Mason, Jr., and Patrick J. Ryan to the Board of Directors of Reichhold Chemicals, Inc., was announced yesterday by Henry H. Reichhold, Chairman of the Board. All three have been long connected with Reichhold.

In addition to the three new members and Mr. Reichhold, other directors of the company are Walter H. Breuer, Albert G. Goetz, C. J. O'Connor, Dr. Stefan H. Baum, Fred Grosius, M. W. Reece, and Paul L. Swisher.

W. W. Marsh, newly elected President of Los Angeles PV&L Association accepting gavel from Wesley Hine.

**WHERE SPEED COUNTS**

The underside and cowling of this Hercules-owned DC-3 have been given a single coat of hot lacquer over a primer. Aircraft manufacturers and airline maintenance crews are finding that hot lacquer can cut the number of coats and application time in half.



**WHITE CHRISTMAS ASSURED**

"Snow" from aerosol dispensers now insures the right decorative Christmas touch no matter what the weather outside. Here "snow" is being packaged in the Hercules Protective Coatings Laboratory with ethyl cellulose.

**FINISH OF THE FUTURE**

The affinity of nitrocellulose lacquers for plastic automobile bodies and other laminates makes it the finish of the future for cars of the future. Lacquer's good coverage hides fiber surface, makes spot repairing and polishing easy. Samples of this application are included in the Hercules Lacquer Trailer, which soon begins another tour of the nation.

*For further technical or marketing information on these or any other developments in lacquer-type coatings made from nitrocellulose, ethyl cellulose, cellulose acetate, or Parlon® (chlorinated rubber), write to:*

*Cellulose Products Department*
**HERCULES POWDER COMPANY**
INCORPORATED
*926 Market St., Wilmington, Del.* CL54-5


### W. Marsh Elected President of Los Angeles PVLA Association

W. W. Marsh, newly elected President of the Los Angeles Paint, Varnish and Lacquer Association, took over the gavel from retiring President, Wesley Hine, at the first 1954-55 meeting of the Association, Tuesday, September 7, in the Los Angeles Room of the Statler Hotel. Marsh is co-owner of Magna Coatings and Chemical Corporation, and Hine is Pacific Southwest Region Manager, Container Division, Rheem Manufacturing Company.

Other new officers of the Association include: Vice President William Fellows, Executive Vice President, Old Colony Paint Co.; and Treasurer R. E. Alexander, Pacific Coast Manager, Archer-Daniels-Midland Co.

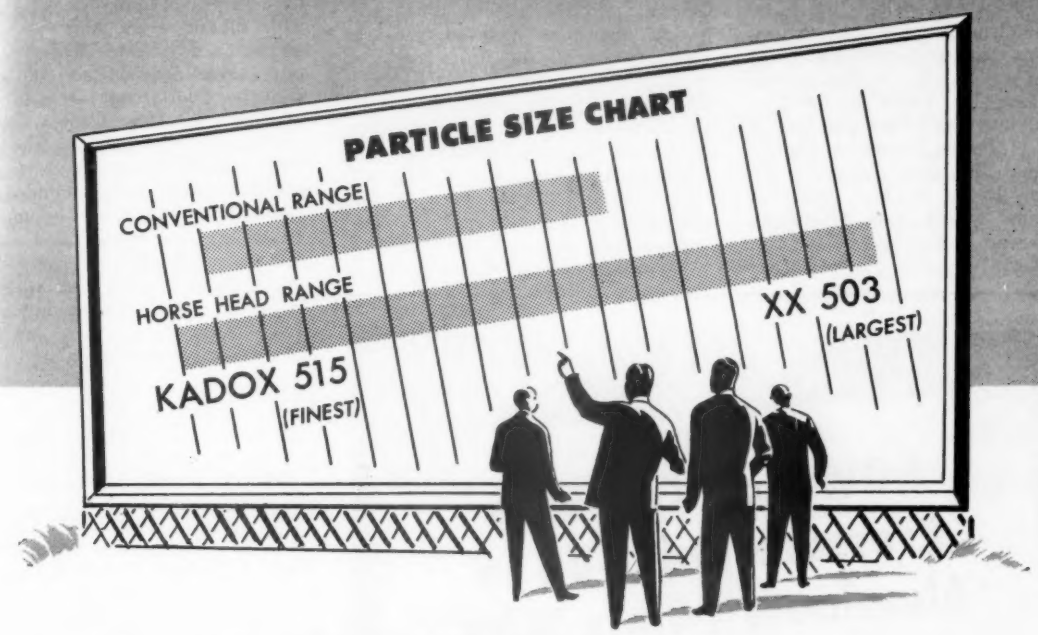
•

### Stuart of Martin-Senour Heads Fund Raising Campaign for IIT

William M. Stuart, paint manufacturer who heads the Martin-Senour Company, will act as general chairman of a campaign which Illinois Institute of Technology is launching to raise funds for expansion of the facilities and services of its Institute of Design, it was announced recently by Dr. John T. Rettaliata, president of the Institute.

Firms benefiting from increased sales due to good design, and practitioners in the various fields of industrial design, are to be solicited for contributions which will total in excess of $300,000. The funds will be applied to financing a new $750,000 building to be constructed in the coming year on the Illinois Tech campus to house the Institute of Design and IIT's departments of architecture and city planning.

# TO FORMULATE FASTER and BETTER with lead-free ZINC OXIDES...

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Take advantage of the wide assortment of particle sizes and other characteristics of Horse Head zinc oxides.

**Speed your formulating:**

You balance your formulas faster — fewer adjustments are necessary — when you select from the broad ranges of oxides in the Horse Head line.

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You compromise less by choosing the oxides that most nearly meet your needs from the Horse Head family.

You build better finishes by using some of the many exclusive Horse Head oxides.

Which Horse Head oxides would you like to test now?

**THE NEW JERSEY ZINC COMPANY**

Producers of Horse Head Zinc Pigments
...most used by paint manufacturers since 1860
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HORSE HEAD PRODUCTS

# NEWS

### Carbide and Carbon Building Oxo Unit at Texas City

Construction of a new unit to produce more than 60,000,000 pounds of chemicals per year by the Oxo process at the Texas City, Texas plant of Carbide and Carbon Chemicals Co., a Division of Union Carbide & Carbon Corporation is nearing completion according to H. B. McClure, President of Carbide and Carbon Chemicals. This new unit at the Texas City plant is one of the largest in the world employing the Oxo process for the synthesis of chemicals.

Using the extremely high pressure reactions of the Oxo process, a large family of new alcohols, aldehydes, and acids will immediately be added to the more than 400 synthetic organic chemicals now produced on a commercial scale by Carbide and Carbon. At the present time commercial quantities of seven new Oxo chemicals are already being produced in pilot plant facilities at the South Charleston, W. Va. plant of Carbide and Carbon. With the initial operation of the new large scale commercial unit the manufacture of many of these will be transferred to Texas City. Production of iso-octyl alcohol, primary decyl alcohols, and primary tridecyl alcohols is planned for the initial operation of the unit which is now scheduled to start in late October.

Five new plasticizers based on these Oxo alcohols have been introduced within the past few months. This points up the importance of the higher alcohols in this large, fast-growing field. In addition, the Oxo alcohols can be used as chemical intermediates for a variety of applications. Reaction with dibasic acids, such as sebacic, adipic, and azelaic acids, produces esters useful as plasticizers and as components of low temperature lubricants and greases. These alcohols are intermediates for both non-ionic and anionic surface-active agents by reaction with ethylene oxide or by sulfation. Tridecyl alcohol is also used in preparation of tridecyl mercaptan used in GR-S rubber manufacture. Monomeric esters of the higher alcohols, such as the acrylates and methacrylates, are used to make specialty polymers and copolymers for coating resins and oil additives.

NOW You Can Stop Pressure Build-Up in Aluminum Paints With
SYLOID® AL-1
Tests conducted by the Aluminum Research Laboratories of Aluminum Company of America ". . . indicate that SYLOID AL-1, when used in concentrations up to 1% based on total weight of paint, effectively retards pressure development in ready-mixed varnish base aluminum paint containing moisture in concentrations up to 0.5%."
This problem of pressure build-up in ready-mixed aluminum paints has long been a serious one. Now this pressure development can be stopped. The leaf stability of the paint is not affected and the drying rate is not retarded.
For complete information on SYLOID AL-1, including results reported by Aluminum Research Laboratories, write
Progress Through Chemistry
DAVISON CHEMICAL COMPANY
Division of W. R. Grace & Co.
Baltimore 3, Maryland
PRODUCERS OF: CATALYSTS, INORGANIC ACIDS, SUPERPHOSPHATES, TRIPLE SUPERPHOSPHATES, PHOSPHATE ROCK, SILICA GELS, AND SILICOFLUORIDES. SOLE PRODUCERS OF DAVCO® GRANULATED FERTILIZERS


•

### Hercules Mobile Lacquer Center Touring Canada

The mobile lacquer information center of Hercules Powder Company hits the road again, this time for Canada.

The trailer is refurbished with new displays which tell the story of important new development in lacquers, chlorinated rubber finishes, a new ink for "Mylar" film, and new hair lacquers.

The mobile exhibit arrived in Canada about October 1. A tentative schedule calls for visits to Windsor, Brantford, Hamilton, Toronto, Ottawa, and Montreal.

Before going on this Canadian trip the exhibit had traveled about 14,000 miles in this country and was visited by more than 8,000 persons.

The exhibit is housed in a custom-built lacquered, 35-foot trailer completely fitted as a traveling display.

A display of high-gloss lacquers includes a door of a new polyester plastic automobile, finished with a coating of white lacquer; and samples of products finished in orange and yellow.

Another display is devoted to multicolored lacquers while a third is made up of examples of the variety of uses for finishes based on "Parlon," Hercules' chlorinated rubber. This latter display includes a miniature swimming pool, to represent this market, and steel and aluminum pipes finished with acid and alkali corrosion-resistant Parlon paints.

A fourth display unit will include a new ink for "Mylar" film; paint removers, and new hair lacquers based on ethyl cellulose.

# PATENTS

*Conducted by*

**Lancaster, Allwine & Rommel**

PATENTS AND COPYRIGHTS

424 Bowen Building,
Washington, D. C.

Complete copies of any patents or trade-mark registration reported below may be obtained by sending 50c for each copy desired to Lancaster, Allwine & Rommel.

### Titanate Coating Solution

*U. S. Patent 2,686,133. Harry H. Beacham, Plainfield, N. J., assignor to National Lead Company, New York, N. Y., a corporation of New Jersey.*

A film forming and drying composition comprising a so ution of a cellulosic derivative selected from the group consisting of cellulose nitrate, lower cellulose aliphatic acylates and cellulose ethers containing from 2 to 7 carbon atoms in the etherifiying group, said cellulosic derivative having from 0.2 to 0.8 free hydroxyl groups per glucose unit, and an alkyl titanate containing from 1 to 12 carbon atoms per alkyl group in a solvent medium consisting essentially of a lower aliphatic liquid solvent having a boiling point substantially no higher than 155°C., and containing a compound having an alcohol radical.

### Phosphate-Type Flame-Proofing Composition

*U. S. Patent 2,686,769. John G. Frick, Jr., and Jeremiah W. Weaver, New Orleans, La., assignors to the United States of America as represented by the Secretary of Agriculture.*

A process of preparing a flameproofing composition comprising subjecting an aqueous emulsion containing (1) a methane derivative of the formula $CX_2X_2$ wherein X is a member selected from the group consisting of chlorine and bromine and Y is a member selected from the group consisting of hydrogen, chlorine and bromine, (2) a polymerizable, neutral, unsaturated alcohol ester of phosphoric acid, (3) an alkali metal bicarbonate in an amount of about from 5 to 8% of the weight of the said methane derivative and the said phosphoric acid ester, and (4) a water-soluble peroxidic polymerization catalyst as the sole catalyst, to heating at a temperature below about 200°C. at which the catalyst forms free radicals and until the emulsion becomes an aqueous suspension in which the nonaqueous phase contains a dispersed polymer having phosphate and halomethyl groups.

### Fluorochlorocarbon Dispersion

*U. S. Patent 2,686,767. Irving Green, Bayonne, N. J., assignor to The M. W. Kellogg Company, Jersey City, N. J., a corporation of Delaware.*

A dispersion which comprises a resinous polymer of trifluorochloroethylene and a waxy polymer of trifluorochloroethylene as a plasticizer dispersed in a liquid dispersing medium comprising water and a water soluble wetting agent of the class consisting of alcohols having not more than 8 carbon atoms per molecule, ketones having not more than 6 carbon atoms per molecule and substituted polyethylene oxides having not more than 30 carbon atoms and having at one terminus a substituent group of the class consisting of alkylphenoxy groups and thioalkyl groups, the concentration of plastic in the total dispersion being between about 10 and about 35 per cent by weight, and the concentration of plasticizer in the total aqueous dispersion being between about 10 and about 25 per cent by weight, said dispersion having been formed by directly admixing a powdered polymer of trifluorochloroethylene having a particle size between about 0.1 and about 10 microns in diameter and said plasticizer in finely divided form with said liquid dispersing medium.

### Flameproofing Composition

*U. S. Patent 2,686,768. John G. Frick, Jr., Metairie, and Jeremiah W. Weaver, New Orleans La., assignor to the United States of America as represented by the Secretary of Agriculture.*

A process of preparing a flameproofing composition comprising subjecting an


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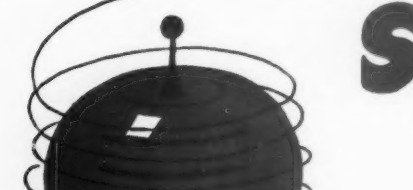

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aqueous emulsion containing (1) a methane derivative of the formula $CX_2Y_2$ wherein $X$ is a member selected from the group consisting of chlorine and bromine and $Y$ is a member selected from the group consisting of hydrogen, chlorine and bromine, (2) a polymerizable, neutral, unsaturated alcohol ester of phosphoric acid, and (3) a water-soluble peroxidic polymerization catalyst as the sole catalyst, to heating at a temperature below about 200°C. at which the catalyst forms free radicals and until the emulsion becomes an equous suspension in which the non-aqueous phase contains a dispersed polymer having phosphate and halomethyl groups.

### Fluorochlorocarbon Dispersion In Ethoxy-Ethanol

*U. S. Patent 2,686,770. Charles D. Dipner, Jersey City, N. J., a corporation of Delaware.*

A dispersion which comprises finely-divided particles of the plastic polymer of trifluorochloroethylene dispersed in 2, ethoxy-ethanol, 1 as a dispersant and xylene as a diluent, said dispersion having been formed by directly admixing a powdered plastic polymer of trifluorochloroethylene with said dispersant and said diluent.

### Acid-Modified Ether Resins

*U. S. Patent 2,686,771. Lynwood N. Whitehill and Robert S. Taylor, Chicago, Ill., assignors to The Sherwin-Williams Company, Cleveland, Ohio, a corporation of Ohio.*

In the manufacture of a resinous product of the ether type by condensation of a dihydric phenol and a difunctional halohydrin in alkaline media wherein the molar ratio of said phenol to said halohydrin is within the ratios of 1:1.1 to 1:1.5, the improvement which comprises adding to the resinous phase subsequent to the removal of water-soluble salts and prior to the final removal of volatiles therefrom by distillation, a catalytic quantity but not more than 1.25% based on the halohydrin content of said resin forming constituents of an acid-reactive phosphorus-containing compound exclusive of the inorganic salts of phosphorus.

### Nonfoaming Rubber Emulsion Paint

*U. S. Patent 2,686,766. Robert M. Silverstein, Aloysius P. Brady, and Arthur G. Brown, Menlo Park, Calif., assignors to El Dorado Oil Works, a corporation of California.*

As a new composition of matter, a synthetic rubber latex base water emulsion paint containing from about 0.05 to 1% volume of a defoaming agent consisting of an alcohol selected

from the group consisting of tetramethylolcyclohexanol, penaterythritol, dipentaerythritol and tripentaerythritol esterified only with an acid selected from the group consisting of alkanoic and alkenoic monocarboxylic fatty acids having from two to eighteen carbon atoms and mixtures thereof.

### Water Paint Containing Enzyme-Digested Protein

*U. S. Patent 2,687,384. Samuel M. Weisberg, East Islip, N. Y., assignor to National Dairy Research Laboratories, Inc., Oakdale, Islip, N. Y., a corporation of Delaware.*

A water paint comprising a synthetic latex and an enzyme-digested protein stabilizer selected from the group consisting of enzyme-digested milk casein and soya protein and prepared by dispersing an isolated protein selected from the group consisting of milk casein and soya protein in water to form a dispersion with the aid of an alkaline substance in an amount to bring the pH to within the range from about 6 to about 8.5, adding a proteolytic enzyme which is active at a pH within that range and is capable of digesting milk casein or soya protein to a stage having calcium ion compatibility, and allowing the enzyme to digest the protein until there is produced a digested protein having bivalent metal ion compatibility as measured by the calcium sulfate test, while retaining good bonding and emulsifying power.

### Treating Glycerides

*U. S. Patent 2,686,193. Byron M. Watson, El Monte, Calif.*

In the method of treating crude glyceride oils and fats to remove the non-oil impurities by the hydration of said impurities the steps which comprise treating the crude oil or fat obtained chiefly from the extractor and which has not been subjected to any substantial centrifuging or refining operation by injecting dry steam into the oil or fat at relatively small proportions and at a relatively low temperature to precipitate the hydrated non-oil constituents, and separating the hydrated non-oil constituents from the oil.

### Fluorescent Coating Containing Boric Acid

*U. S. Patent Shannon Jones, East Cleveland, Ohio, assignor to General Electric Company, a corporation of New York.*

A fluorescent coating composition comprising a suspension of finely divided phosphor particles in a lacquer comprising a cellulosic binder and a solvent therefor which is not substantially miscible with water and also containing about 0.1 to 0.7 per cent, by weight of the phosphor of, finely dispersed boric acid formed in situ by the incorporation therein of a hydrolyzable boric acid ester together with water in a small amount of about 1% by volume of the lacquer and sufficient to hydrolyze the boric acid ester and a coupling agent which is miscible with water and with said solvent.

### Fluorescent Coating

*U. S. Patent 2,686,157. Shannon Jones, East Cleveland, Ohio, assignor to General Electric Company, a corporation of New York.*

In a fluorescent coating comprising a suspension of finely divided fluorescent material in a lacquer comprising a cellulosic binder and a solvent therefor which is not substantially miscible with water, the improvement which comprises the presence of a small amount of about 1% by volume of the lacquer of water together with a coupling agent which is miscible with the water and the said solvent.


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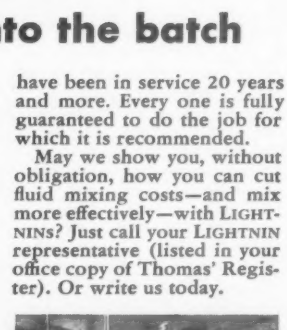

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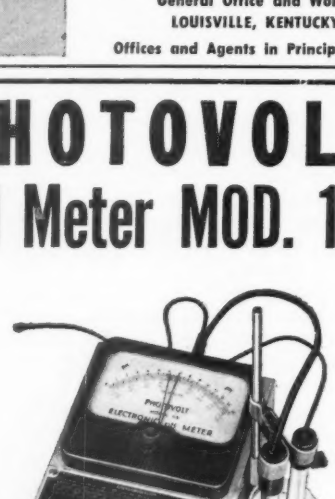

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## CASEIN STABILIZERS

*(From page 37)*

mended because the thick stage of the mixing cycle is thus avoided. However, this sequence applied to some grades of casein may produce a very thick solution when cooled.

A dry prepared stabilizer is dissolved in the same manner without the addition of ammonia or any alkali. Liquid prepared stabilizers need no preparation.

*Incorporating Stabilizer in the Paint*

Since the casein solution is of the nature of a pigment dispersant, it is generally combined with the pigment in roller or colloid milling, or a portion only of the casein solution may be used for this purpose. Some advantage is gained by adding the casein solution while still warm. In high speed stirring equipment or change-can mixers, the casein is added after the pigment has become well dispersed. The auxiliary ingredients, including anti-foam, deodorant, plasticizer and thickener (if used) are then added. All authorities agree that the latex is to be added last and blended in under mild agitation.

*Stabilizer Cost*

Though the stabilizer is a minor ingredient in the complete paint from the standpoint of weight percent, some consideration is given to its cost. At a concentration of 1 percent in the complete paint, casein of recommended paint grade, plus the necessary ammonia, accounts for about 2 percent of the raw material cost of the paint. This estimate increases to from 3 to 5% for prepared casein stabilizers.

The decision with respect to the use of straight casein versus prepared casein stabilizers depends upon the cost of preparing stabilizer in the paint plant, including equipment and labor costs, and the expense of careful control in preparation to avoid the possible loss of off-grade batches.

The requirements of stabilization of existing latex paints have been met by casein and casein products to a degree that generally satisfies both the paint maker and the customer. What has been accomplished, however, applies primarily to paints made from those types of latex first introduced. However, two trends are occurring, of which the industry is well aware, one being the development of improved latices of the conventionally used types and the other creation of wholly new types designed for coating purposes. The objective is reached only when a completely serviceable paint has been formulated with the new latex. As to stabilization by the addition of casein or other colloid, the requirements can be expected to differ for the different latices. Research and evaluation work by both the materials producer and the paint maker are going on continuously so that full advantage can be taken of the new vehicles as they appear.

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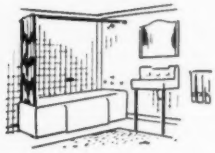

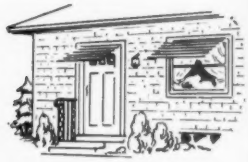

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## CALENDAR OF EVENTS

**Oct. 11-13.** American Oil Chemists' Society Meeting, Hotel Radisson, Minneapolis, Minn.

**Oct. 12-15.** Nat'l. Chemical Exposition Chicago Coliseum, Chicago.

**Oct. 21-23.** Nat'l. Paint Salesmen's Assoc. Convention, Willard Hotel, Washington, D. C.

**Nov. 15-17.** 66th Annual Convention, National Paint, Varnish, and Lacquer Assoc., Palmer House, Chicago.

**Nov. 18-20.** 32nd Annual Meeting of Federation of Paint and Varnish Production Clubs, and 19th Paint Industries' Show, Palmer House, Chicago.

**Production Club Meetings**

**Baltimore,** 2nd Friday, Park Plaza Hotel.

**Chicago,** 1st Monday, Furniture Mart.

**C.D.I.C.,** 2nd Monday.
Cincinnati — Oct., Dec., Mar., May, Hotel Alms.
Dayton — Nov., Feb., April, Suttmillers.
Indianapolis — Sept., Claypoll Hotel.
Columbus — Jan., June, Fort Hayes Hotel.

**Cleveland,** 3rd Friday, Harvey Restaurant.

**Cleveland,** 3rd Friday, Harvey Restaurant.

**Dallas,** 2nd Thursday, No Fixed Place.

**Detroit,** 4th Tuesday, Rackham Building.

**Golden Gate,** Last Monday, El Jardin Restaurant, San Francisco.

**Houston,** 2nd Tuesday, Seven Seas Restaurant.

**Kansas City,** 2nd Wednesday, Pickwick Hotel.

**Los Angeles,** 2nd Wednesday, Scully's Cafe.

**Louisville,** 3rd Wednesday, Seelbach Hotel.

**Montreal,** 1st Wednesday, Queen's Hotel.

**New England,** 3rd Thursday, Pruitan Hotel, Boston.

**New York,** 1st Thursday, Brass Rail, 100 Park Ave.

**Northwestern,** 1st Friday, St. Paul Town and Country Club.

**Pacific Northwest,** Annual Meetings only.

**Philadelphia,** 3rd Wednesday, Engineer's Club.

**Pittsburgh,** 1st Monday, Fort Pitt Hotel.

**St. Louis,** 3rd Tuesday, Forest Park Hotel.

**Southern,** Annual Meetings Only.

**Toronto,** 3rd Monday, Diana Sweets, Ltd.

**Western New York,** 1st Monday, 40-8 Club, Buffalo.

# abstracts

### Paint Viscosity and Ultimate P.V.C.

*By W. Asbeck, G. Scherer, and M. Van Loo, The Sherwin-Williams Co. Chicago, Ill. Presented before the Div. of Paint, Plastics, and Printing Ink Chemistry, ACS, Sept. 12-17, 1954 in New York, N. Y.*

The Vand and Brailey equations relating the viscosity of suspensions in Newtonian liquids with the concentration of pigment present may be employed in practical viscosity measurements of paint systems. Because of the difficulty of determining the constants $K$, the pigment shape factor, and $q$, the immobilization constant, for these derived equations, a hyperbolic form giving results very similar to the theoretical equations was employed. The two constants $k$ and $U$ are very easily obtained for this equation by graphical computation. $k$ and $K$ are very nearly proportional while $U$, the densest rheological packing system for the particular dispersion is a function of $q$. This rheological packing system is not equivalent to the densest physical packing system obtained by determining the ultimate pigment volume concentration (UPVC) of that dispersion. The UPVC method may find application in the paint industry to characterize pigments as a substitute for present oil absorption tests.

Combination of the above equation with a second empirical hyperbolic equation correlating the structure of pigmented systems with concentration of pigment, permits a prediction of the viscosity of any concentration of pigment in a Newtonian vehicle for any chosen high shear velocity. The two constants required for the structure equation $\mathfrak{a}$ and $\delta$, can be obtained from the same data required to determine $k$ and $U$. These basic data are obtained quite simply from the high shear viscosity curves of the system at two or more levels of pigmentation.

### Drying Oil Studies

*By S. Crecelius, R. Kagarise, A. Alexander, Naval Research Laboratory, Washington, D. C. Presented before Div. of Paint, Plastics, and Printing Ink Chemistry, ACS, Sept. 12-17, 1954 in New York, N. Y.*

The study of the drying mechanisms and deterioration of drying oil films brought about by autoxidation has been difficult in the past since the insoluble, polymerized nature of these materials have rendered the chemical techniques available somewhat inadequate.

The application of infrared spectroscopy has provided a novel approach to this problem. In this study infrared spectra have been observed during various stages of autoxidation of linseed and dehydrated castor oil films. In addition, observations have been carried out on previously dried films of these two oils at various periods of exposure to intense ultra-violet light.

These results are compared with infrared spectral studies on these types of materials made by previous investigators, with particular reference to the formation and change of various chemical groups such as hydroxyls, peroxides, carbonyl, and unsaturated carbon double bonds. The suggestion is made as to the type of poylmerization which may predominate as indicated by the spectral evidence together with observations made by other investi-


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COLD CUT

| Gallons | Pounds | |
|---|---|---|
| 17.3 | 143 | Neville LX-685, 70% Solution |
| 20 | 162 | Bodied Linseed Oil (Z-5 visc.) |
| 18.6 | 119 | Mineral Spirits |
| | 1.33 | 6% Cobalt Naphthenate |
| 56 | 425.33 | |

Method of Preparation: Blend together with good agitation.

COOK

| Gallons | Pounds | |
|---|---|---|
| | 100 | Neville LX-685,135 |
| 10 | 78 | China Wood Oil |
| 15. | 116 | Alkali Refined Linseed Oil |
| 40 | 255 | Mineral Spirits |
| | 1.6 | 6% Cobalt Naphthenate |
| | 2.4 | 24% Lead Naphthenate |
| | 0.4 | 6% Manganese Naphthenate |
| 74 | 553.4 | |

Method of Preparation: Body combined oils at 585°F., check with LX-685, 135 Resin, reduce, and add driers.

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Plants at Neville Island, Pa. and Anaheim, Cal.

gators. The decomposition of films exposed to ultraviolet has been followed and weight losses have been correlated with the disappearance of various bonds in the infrared spectra.

### Isophthalic Acid in Oil Modified Alkyds

*E. Carlston, F. Lum, G. Johnson, California Research Corp., Richmond, Calif. Presented before the Div. of Paint, Plastics, and Printing Ink Chemistry, ACS, Sept. 12-17, 1954 in New York, N. Y.*

This paper reports the condition of some paints made from isophthalic oil modified alkyd resins after exposure to outdoor weathering for a period of nearly five years in Florida and California. An interesting correlation of a six-month accelerated test in an Atlas Weather-Ometer with a five-year outdoor exposure test is also reported.

Isophthalic alkyd resins containin3 75 to 80% soybean oil are in excellent condition after nearly five years of outdoor weathering and are equal to conventional phthalic anhydride alkyd resins containing 65% soybean oil. An isophthalic alkyd type of house paint vehicle containing 90% of soybean oil is also in good condition after nearly five years of outdoor weathering and is considerably better than conventional linseed oil house paint vehicles or a similar alkyd type of vehicle made from phthalic anhydride. Mildew resistance of an isophthalic alkyd type of heat-bodied soybean oil is outstanding.

This work supports the view that isophthalic acid is a dibasic acid that should develop great commercial importance as a raw material for the production of oil modified alkyd resins and other plastic products.

### Isophthalic Acid in Unsaturated Polyesters

*E. Carlston, F. Lum, G. Johnson, California Research Corp., Richmond, Calif. Presented before the Div. of Paint, Plastics, and Printing Ink Chemistry, ACS, Sept. 12-17, 1954 in New York, N. Y.*

This study of the properties of unsaturated polyesters made from isophthalic acid was undertaken as a continuation of previous work on isophthalic condensation polymers.

Isophthalic acid is an excellent material for use in unsaturated polyesters. Compared to phthalic anhydride, isophthalic acid produces polyester resins with substantially higher softening points. This results in resins that are free-flowing in lump or powder form, in contrast to the sticky, balsam-like polyesters that result from phthalic anhydride. Styrene solutions of isophthalic unsaturated polyesters are much higher in viscosity than comparable solutions of phthalic anhydride polyesters. Cured resins from isophthalic polyesters have considerably better flexural strength properties, and impact strengths are improved greatly when the isophthalic content of the polyester is high. Also, the heat distortion temperatures of cured resins made from isophthalic polyester are significantly higher than those of similar resins made from phthalic anhydride.

This work shows that isophthalic acid is a dibasic acid that should be of great interest to the reinforced plastics industry.

### Adhesion Studies

*By L. Brantley, J. Charnell, B. Stott, K. Bills, Occidental College, Los Angeles, Calif. Presented before the Div. of Paint, Plastics, and Printing Ink Chemistry, ACS, Sept. 12-17, 1954 in New York, N. Y.*

The effect of additions of stearic acid on the adherometer adhesion or "hesion" of an unplasticized ethylcellulose lacquer to 24 ST aluminum and to glass is reported. Comparison is made with the tensile product of the corresponding free films. Modification of the adherometer to obtain tensile strength and elongation for such comparative measurements is described.

Use of the adherometer for the measurement of the coefficient of friction of glass or metal to ethylcellulose coatings containing varying amounts of stearic acid is described for comparison with the corresponding "hesion" values.


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(*From page 32*)

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The use of the graeco-latin square experimental design for the investigation of the effect of the percentage of a) ethoxy groups, b) water, c) plasticizer, d) mixed solvent composition, and e) drying conditions on the "hesion" of an ethylcellulose lacquer to aluminum is described. The percentage of ethoxy groups and plasticizer content were found to be significant for both air drying and accelerated drying. For further evaluation of the effect of solvent on the "hesion" of plasticized ethylcellulose lacquers to aluminum, a series of tests was made using different types of solvent mixtures.

### Curing Characteristics of Furfuryl Alcohol Polymers

*By L. Brown and P. Huett, The Quaker Oats Co., Chicago, Ill. Presented before Div. of Paint, Plastics, and Printing Ink Chemistry, ACS, Sept. 12-17, 1954 in New York, N. Y.*

The effect on rate and degree of cure of such factors as viscosity, modifying reactants, buffer salts, unchanged furfuryl alcohol, temperature, and nature and concentration of catalyst are shown on six types of furfuryl alcohol resins. Variables studied in the preparation of these resins are pH, temperature, time, absence of oxygen, and nature of catalyst.

Furfuryl alcohol-formaldehyde resins cure faster and more completely at lower catalyst concentrations than any other furfuryl alcohol type. Conventional batch process furfuryl alcohol resins have a rapid initial cure, but monomer-free furfuryl alcohol polymers cure more completely than the former at higher catalyst concentrations. Resins with low buffer equivalent values cure faster than comparable resins with high values. Maleic and oxalic acids are effective catalysts for curing furfuryl alcohol-formaldehyde resin at 320°F; at lower temperatures a stronger acid such as *p*-toluenesulfonic acid is necessary.

### Carbon Black in Un-Saturated Polyester

*By C. Sweitzer, F. Lyon, T. Grabowski, Columbian Carbon Co., New York, N. Y. Presented before the Div. of Paint, Plastics, and Printing Ink Chemistry, ACS, Sept. 12-17, 1954 in New York, N. Y.*

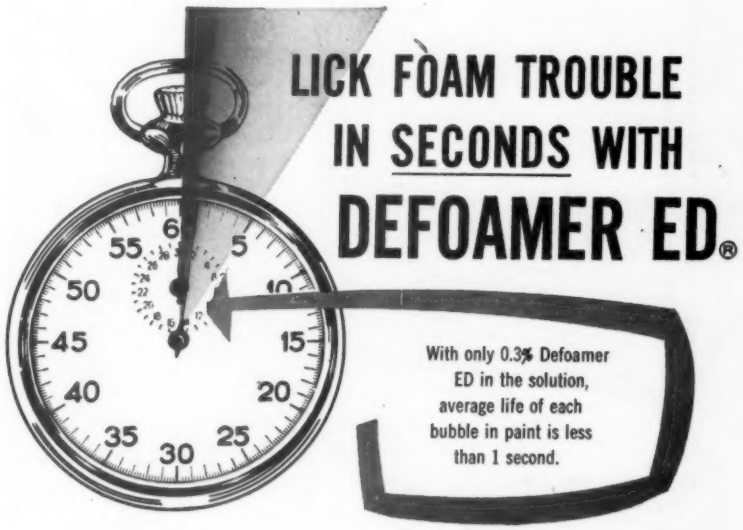
The investigation and application of carbon black as a reinforcing pigment in unsaturated polyester resins has been restricted because of the observed severe cure retarding effect of carbon black in these resins. The purposes of the present study were to investigate the interaction of carbon black and the peroxide curatives employed and to develop practical curing systems for carbon black-polyester mixtures.

Preliminary investigations confirmed in general this cure retarding effect of carbon black in polyester resins catalyzed by organic peroxides. However, it was found that in the presence of certain peroxide-promoter combinations carbon black actually accelerated cure. By the proper selection of promoters or combination of promoters a wide range of cure times was obtained. This unique combination of properties associated with carbon black, that of inhibiting cure of the catalyzed resin and of accelerating cure of the final mix, it is suggested, should be of great interest and potential value to the fabricators of these resins.

The type and concentration of carbon black, the combinations of catalyst and promoter, the type of resin, and the cure temperature were all found to be factors in the control of cure rate and in the development of hardness properties of the carbon black-polyester resin mixtures.

Qualitative mechanisms of carbon black-peroxide interactions are presented with particular reference to the role of carbon black in inhibiting and accelerating cure rate. The structure of the peroxide catalyst and the surface chemistry of the carbon were found to be factors influencing polymerization rate.

The evaluation of cured polyester-carbon mixtures has been limited to hardness tests. In general carbon black increases the hardness of the polyester resin.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## Model for the Flow Of Dispersions

*By R. Myers, A. Zettlemoyer, National Printing Ink Research Institute, Lehigh University, Bethlehem, Pa. Presented before the Div. of Paint, Plastics, and Printing Ink Chemistry, ACS, Sept. 12-17, 1954 in New York, N. Y.*

A simple mechanical model consisting of one spring and one dashpot has been proposed for the flow of viscoelastic systems, and a physical interpretation has been provided for the case of dispersions.

The model differs from the series array of Maxwell and the parallel array of Voigt in that the basic unit is the dashpot whose internal member consists of an elastic disk, rather than the rigid plunger heretofore assumed. The spring is arranged perpendicular to the dashpot and to the direction of liquid enclosed by the shell.

One advantage of the proposed model is that a rheological equation of state can be written in the form

$$S = nD + f(S)$$

which can be used to characterize dispersions which are essentially liquids and which generally are represented by means of flow curves. An additional feature is that the integrity of the spring is preserved under conditions of continuous shear.

The physical significance of the material constant $n$ and of one type of spring resulting from an experimental evaluation of the f($s$) term in the rheological equation of state is pointed out.

## Viscosity Relations of Heated Vegetable Oils

*R. Sims, National Research Laboratories, Ottawa, Canada.* Presented before the *Div. of Paint, Plastics, and Printing Ink Chemistry, ACS, Sept. 12-17, 1954 in New York, N. Y.*

When the logarithms of the dynamic and kinematic viscosities of linseed safflower, and tung oils were plotted as functions of heating time, parallel curves were obtained in the range of 0.4 to 100 stokes. Kinematic viscosity is therefore as useful an index of polymerization as dynamic viscosity.

Polymerized linseed, safflower, and tung oils and the methyl esters derived from them were separated quantitatively by molecular distillation into monomeric and polymeric glycerides and mono-, di-, tri- and $n$-meric esters. Emperical relations were established between the bulk kinematic and acyl groups. In viscosity and polymer content, safflower oil resembled linseed oil whereas tung oil showed marked difference.

At 310°C., the accumulation of reaction products in the absence of a sweep of an inert gas, reduced the rate

of polymerization of linseed oil but did not affect its polymer content. At 220°C., the ratio of trimer to dimer was larger and the *n*-mer to trimer ratio smaller than when linseed oil was polymerized at 310°C.

### Evaluation of Coatings For Hot Water Tanks

*By G. Hudson, B. Brand, E. Mueller., Battelle Memorial Institute, Columbus, Ohio. Presented before Div. of Paint, Plastics, and Printing Ink Chemistry, ACS, Sep. 12-17, 1954 in New York, N. Y.*

This paper describes laboratory tests and the test results obtained in an evaluation of organic coatings for use on the interiors of domestic hot water tanks cathodically protected with magnesium anodes. The functions of a coating in this use are (a) to prevent an excessive consumption of the magnesium anode in waters having low electrical resistance and (b) to concentrate protective currents at uncoated areas of the tank in waters having high electrical resistance.

Test results showed that the effects of cathodic protection would contribute most to the failure of coatings in this use. Coatings not possessing a high alkali resistance can be quickly and progressively destroyed by alkaline solutions formed as a result of cathodic protection. Coatings having a high alkali resistance are subjected to an accelerated blistering as a result of the cathodic environment. However, alkali resistant coatings offer promise in this work since they maintain a high electrical resistance even when blistered. It has not been determined whether or not blistering will continue to a point at which complete loss of coating adhesion to the tank would occur.

### Vegetable and Fish Oil Treatment

*By R. Tess, H. Dannenberg, Shell Development Co., Emeryville, Calif. Presented before the Div. of Paint, Plastics, and Printing Ink Chemistry, ACS, Sept. 12-17, 1954 in New York, N. Y*

Various vegetable and fish oils were improved in several respects by treatment with small quantities of di-*tert*-butyl peroxide at elevated temperatures. In general, molecular weight and viscosity were increased without appreciable loss of unsaturation. Slight bleaching also was effected, and in the case of herring oil the characteristic severe darkening normally obtained upon heating was substantially inhibited. In addition, the objectionable odor of herring and sardine oils was lessened. Drying rates of the oils were improved, particularly in the case of sardine and herring oils, and "after-tack" of some oils was eliminated.

This process offers a new method for the preparation of fish and vegetable oils of increased molecular size. Compared to corresponding conventional heat-bodied oils of equal molecular weight, peroxide-treated sardine and linseed oils had higher iodine values, lighter colors, lower viscosities, lower acid numbers, and better drying properties. Compared to heat-bodied oils of equal viscosity, peroxide-treated oils possessed higher molecular weights, superior drying properties, and lower acid numbers.

At the temperature of 150° to 175°C. usually employed in the treatment, use of cumene hydroperoxide, benzoyl peroxide, and hydrogen peroxide were not effective in improving the drying rate of sardine oil, but *tert*-butyl peroxide hydroperoxide was about half as effective as di-*tert*-butyl peroxide.

In white house paint formulations, treated sardine oil was superior, but untreated sardine oil was inferior to linseed oil in drying rate. Peroxide treatment of sardine oil improved grinding ease and brushability but had no effect on durability upon exposure. Herring oil paints had excellent color retention but limited durability.

The principal reaction involved in the treatment of oils with di-*tert*-butyl peroxide appears to be dehydrodimerization accompanied by some isomerization of double bonds. Physical constants and ultraviolet and infrared absorption spectra are consistent with this explanation.


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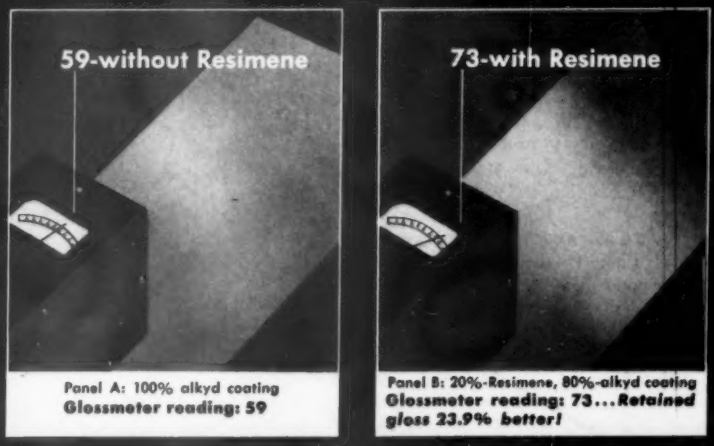


Panel A: 100% alkyd coating
Glossmeter reading: 59

Panel B: 20%-Resimene, 80%-alkyd coating
Glossmeter reading: 73...Retained gloss 23.9% better!

Two test panels were coated with the formulations above, then exposed to weather in Florida for 12 months, at 45 degrees facing South. Before exposure, both panels had Glossmeter readings of 93. After exposure, Panel A, with 100% alkyd coating, had a reading of only 59. Panel B, with a coating of 20% Resimene 881 and 80% alkyd, had a reading of 73—proving that this formulation retained gloss 23.9% better!
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# News of Paint and Varnish Production Club Meetings

Dr. Eugene Allen

## New York

The first Fall meeting of the New York Paint and Varnish Production Club was held at the Brass Rail, 100 Park Avenue, New York City on September 15th. The meeting, which was sponsored jointly with the Division of Paint, Plastics and Printing Ink of the American Chemical Society, was attended by well over 500 members and guests including a large contingent representing the New York Printing Ink Production Club.

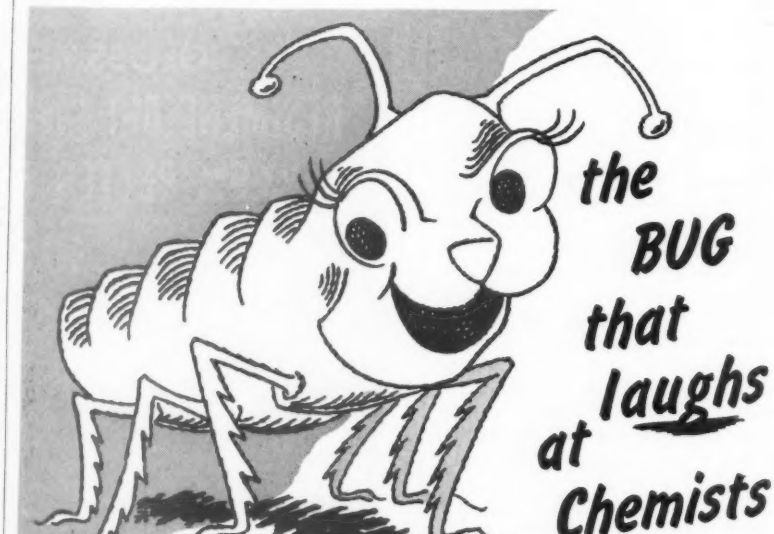
Among the many prominent guests introduced during the evening were Dr. A. C. Elm, the 1953 Mattiello Lecturer; M. Westgate of the National Paint, Varnish and Lacquer Ass'n; Dr. C. H. Pickett, Chief of Paint Testing, Aberdeen Proving Grounds; Dr. A. Alexander of the Naval Research Laboratories and Sec.-Treas. of the Division of Paint Plastics and Printing Ink Chemistry of the A.C.S.; Dr. W. Lundberg, Exec. Director of the Hormel Institute, U. of Minnesota, and Head of the Federation Research Projects Group; Dr. W. C. Walker, Assoc. Director of the National Printing Ink Research Institute; Wm. J. Foy, Vice Pres. of the C.D.I.C. Club; Wm. Jauch of the Montreal Club; Robert Fraser, Tech. Dir. of Robert Bowran Ltd., Gateshead, England; and the speaker of the evening, Dr. Eugene Allen of the American Cyanamid Co., Bound Brook, N. J..

Dr. Allen's talk, "Color: How the Eye Sees It and Instruments Measure It", develops the advantages of pinpointing color as a definite numerical specification similar to melting point and specific gravity, and subjecting this color factor to instrumental measurement.

In reviewing the history of color measurement techniques, Dr. Allen demonstrated, by the use of numerous slides, the development of a color measurement system based on differences in hue, lightness, and saturation. When these three properties are arranged as the axes of a three dimensional diagram, as in a color tree, it is theoretically possible to specify completely any color, but the cataloging or defining of a given color in practice by this method is still dependent on the observer and remains a highly subjective procedure.

The most fundamental means of specifying a color instrumentally is to determine its spectrophotometric curve, which measure of how much light of a given wavelength is reflected from the sample. Since each pure spectral color can be specified in terms of the amounts of three standardized primary colors needed to match it, it is possible to integrate a given spectrophotometric curve and derive its tristimulus values. The three physical properties, dominant wavelength, purity, and luminance, derived from any spectral curve by means of tristimulus values, closely approximate the psychological attributes of hue, saturation, and lightness, and the relationship is the basis of the instrumental method of color measurement.

Applications of the instrumental technique of color classification to problems of product control, sales


SHELLAC is a durable, transparent coating made from lac. Practically the entire supply of this substance comes from south-east India where the female lac bug has a monopoly on its manufacture. These small insects, about 1/30" in length, attach themselves to trees by the myriads and suck the sap from the branches. The female exudes a resinous substance which she forms into cell-like shelters for her eggs. The lac is harvested by shaking the encrusted twigs so that the resin falls to the ground.

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presentation, and lab evaluation tests were demonstrated, and support Dr. Allen's view that this powerful tool will assume increasing value in those industries dealing in colored materials.

**Northeastern**

"Additives—A Tool in the Formulation of Organic Coatings" was the subject for the New England Paint and Varnish Production Club's opening meeting of the 1954-55 season at the University Club. Mr. Elias Singer of the Troy Chemical Company discussed bodying agents, mildewcides, and anti-sagging agents, emphasizing that additives should be considered as raw materials in the formulation. Use of additives in typical architectural enamels, interior flats, and house paints to secure quality improvements, often at lower cost, was illustrated.

The annual presentation of the Nuodex gavel to the incoming president was made by Howard Cookingham of D. H. Litter Company to Harry Kelfer.

Harold Ellsworth, past President, who recently moved out of the New England area, was unaminously voted an Honorary Member of the Club.

A minute's silence was observed in memory of C. W. Clark, an Honorary Member, who passed away last summer.

**Northwestern**

The September meeting was called to order by President Jake Skala at 8:40 P.M. with 74 members and guests present. President Skala introduced Dr. Calvin Overmyer, President of the Federation, who in turn introduced three former Federation Presidents: Bob Matlack, Jim Kortum, and Gus Wescott. He also mentioned the following honored guests: Charles Moore (Chicago), Ray Adams (Southern), Jim Tomecko (Montreal), L. Odell (Houston), Clyde Smith (Los Angeles), and H. G. Sholl (Baltimore).

Each person then identified himself by name and company affiliation. The minutes of the May meeting were read and approved.

Elmer Stark announced the subject of the Open Forum Meeting in October would be the Color Aptitude Test. James Porter, the Committee Chairman, stated reports on color testing and color control will also be dealt with.

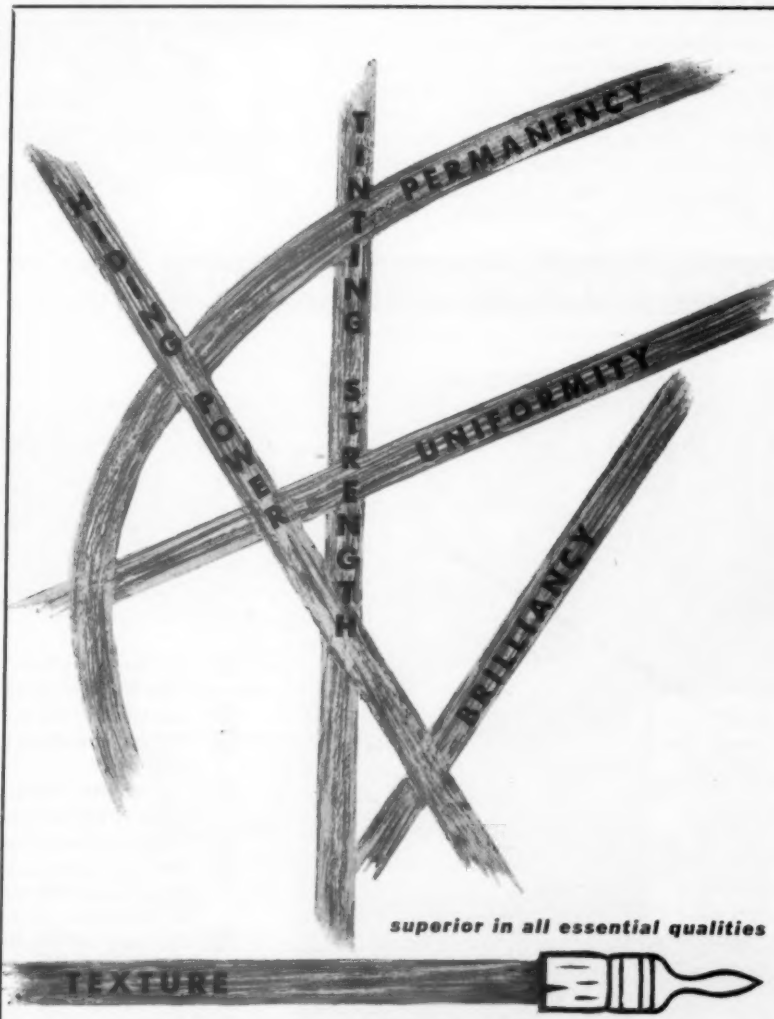
Irv Wangsness, Chairman of the 1954 Technical Committee, has an abstract prepared and a paper entitled, "A Nomograph for Alkyd Formulations", which will be submitted at the annual meeting.

Floyd Nelson related that a meeting of the 1955 Technical Committee had been held in July and another one is scheduled in a month.

Ed Carlson, our Council Representative, reporting the May '54 meeting, stated that an amendment proposing the members at large in the Board of Directors be increased from 6 to 9 was introduced in May '53 and voted on in November of that year, but failed to pass on a two-thirds vote. This would be accomplished by extending the term of office from two to three years. Ed pointed out that in three years a man becomes more experienced and therefore more qualified to contribute much more than at the present two year level. Because of this, these amendments were again re-introduced this year with some very energetic and spirited discussion; however, some Council representatives still opposed. Mr. Carlson requested that we all read the July Official Digest and give this matter some real thought and consideration; then be prepared to give him proper guidance.

President Skala appointed the following Committee to work with Ed Carl on this matter:
Maury Hansen-Chairman, Lowell Wood, Ed Erickson, and Ed Carlson.

Elmer Stark, Program Chairman, introduced C. Homer Flynn, Executive Secretary of the Federation, who told us his staff handled from 80 to 100 pieces of mail a day from all over the world. They have the responsibility of publishing the "Official Digest", which is our closest contact with the Federation. In addition they publish a Year Book and this year they put out Volume I "Steel Structures", Painting Manual. The Color Aptitude Test also came out of Federation Headquarters, and to date 125 sets have

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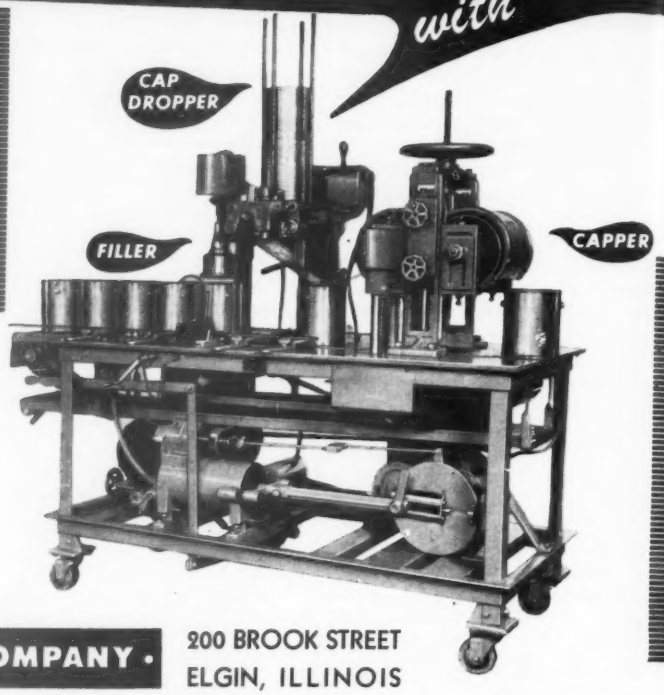


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6. You can run red, or blue or green and be ready for white in ten minutes (slightly longer for oil paints).
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**WRITE FOR CATALOG 68** ***for the complete story.***

Address Department 64

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been sold;—In the fields of Textiles, Ceramics, Plastics, Printing Ink, Paints as well as educational institutions. Mr. Flynn introduced Milt Glaser, Treasurer of the Federation, who declared the Federation literally handles tens of thousands of dollars, and is really big business. He said there are two general funds, one operating the Official Digest, and the other Education and Research. He urged all to attend the Annual Meeting, as much of the income is derived from it. Finally Mr. Glaser stated that while money is accumulating for some worthy project, it must be invested wisely, and hastened to add that financially, the Federation is very sound and in good hands. He then introduced Mr. N. P. Beckwith, President-elect, whose job it is to correspond with 300 men and bring them together for the various committees. This year Mr. Beckwith, through his committee, mailed out 125 questionaires in regard to C.A.T. and received over 1000 replies which will be tabulated to give whatever facts there are concerning the test. He then turned the balance of the meeting over to Dr. Overmyer who announced that next year the Annual Meeting will no longer be a joint meeting with the National Paint Varnish and Lacquer Association. He reminded us of the difficulty of management and technical being away at the same time; also the confusion that occurs when one group is trying to get settled in a hotel before the first group has to left. Dr. Overmyer stated that now meetings can be held when and where they are more favorable. He mentioned that zone meetings have been discussed, and a committee will report on the advisability of such a move.

Dr. Overmyer then recounted his voyage via B.O.A.C. Airliner to Birmingham, England for their 25th Anniversary. He also gave us some of his most unforgettable experiences while over there. In closing, Dr. Overmyer exhorted all to continue to work for our Club and the Federation.

### CDIC

The 342nd meeting was held at Marriott Hotel, Indianapolis, Sept. 13th with 53 members and guests present. After reports and regular business, Bill Foy presented Paul Marling in a talk on "Systematic Study of Low Odor Alkyd Paints," which was illustrated by tables, slides, colored photos and bar graphs. The group which carried out the experimental work was composed of Dr. J. M. Purdy, Lowe Bros.; R. W. Lipp, Moran Paint Co.; Jack Heller, PPG Co.; Bert Lederman, New Wrinkle, Inc.; and Capt. R. M. Van Vliet, Wright Patterson Field.


Just a note about

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Spencer Kellogg's dehydrated Castor Oil, SYNTHENOL, leads its field in quality and performance.

Synthenol is prepared in three viscosities: G-H for alkyd resins, and U-V and Z2-Z3 for varnishes and enamels.

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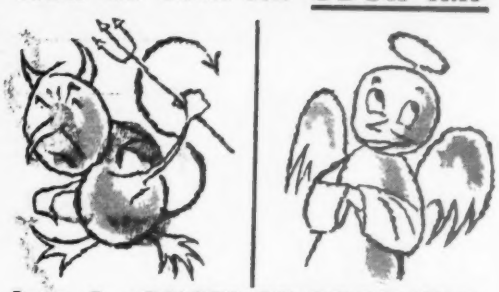

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## PECK SERVICE CAN HELP

(*From page 34*)

specialist is often required if unsatisfactory results are to be eliminated . . . possibly before reformulation is undertaken.

The story is told of a chemical firm's technical service specialist who diagnosed a lacquer manufacturer's difficulties as due to dirt in the equipment and in the plant itself. Then to prove his point, he brought in two assistants over a week-end and gave the plant and equipment a good scrubbing. This may be a little unusual. It does, however, illustrate the thoroughness and versatility sometimes demanded of a supplier's technical service department.

As with many service operations, the size of a technical service laboratory must be commensurate with the scope of its work. Often the technical service department will start small and gradually increase in size as the demands for its help multiply in number and in character.

A good example of this pattern of growth is the Celanese Technical Service Department, mentioned above.

When Celanese, a pioneer in plastics and man-made textile fibers, went into petrochemical production, the initial goal was a limited one: to have a reliable and economical source of acetic acid and acetone, essential in the manufacture of cellulose acetate for plastics and fibers. The question quickly arose of orienting the valuable co-products of the petrochemical processes to their proper markets.

One of the earliest of these marketable co-products was a solvent blend named "Solvent 601." As always with new products of this kind, there arose technical problems as to its application. No one was in a better position than Celanese to help show how it could be efficiently employed.

To put it another way, new applications and technical service bear a kind of reciprocal relation to each other. The success of a new application often depends on thorough understanding of surface coating production problems and marketing problems which technical service brings to light. For technical service may suggest that we use commonly applied components in new combinations, or it may suggest that we try using other chemicals, which the specialist's experience and judgment tells him will probably work, although never used this way before, while new application may pose new problems for technical service to solve.

The size of Celanese's technical service and application laboratories has gradually increased with the growth and diversification of the company's chemical manufactures. Celanese's surface coating specialists spend a substantial part of their time in the field, working with surface coating firms in their own plants.

The relation of the chemical salesman to the technical service department is extremely important. He is in constant touch with surface coating firms, and is in a good position to learn what their problems are. He can then call his company's technical service specialists into the picture to provide whatever technical help and advice the coating manufacture wishes. The salesman, is essentially a marketing, not a technical specialist, although he may have a broad technical knowledge. The technical service man is a full time specialist in certain types of products though he usually has some knowledge of marketing problems. Together they make a valuable team.

It has been well said that there is no substitute for experience. This is particularly true in the manufacture of surface coatings. Thus, the chemical company with a well functioning team of experienced salesmen and surface coating specialists is an asset both to its customers and its stockholders. And the surface coating manufacturer, large or small, who takes advantage of a good technical service set-up made available by a supplier, will find it pays dividends for him.

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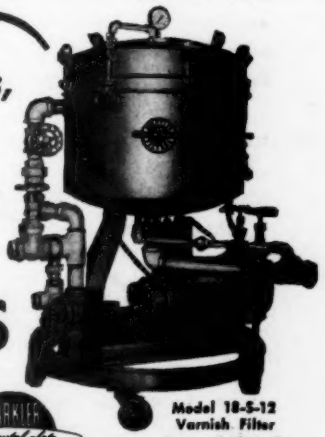
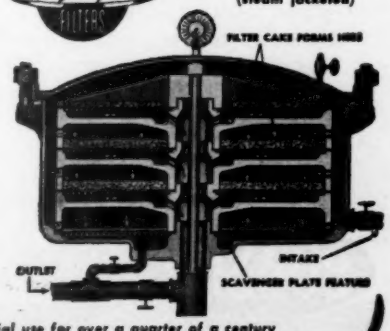
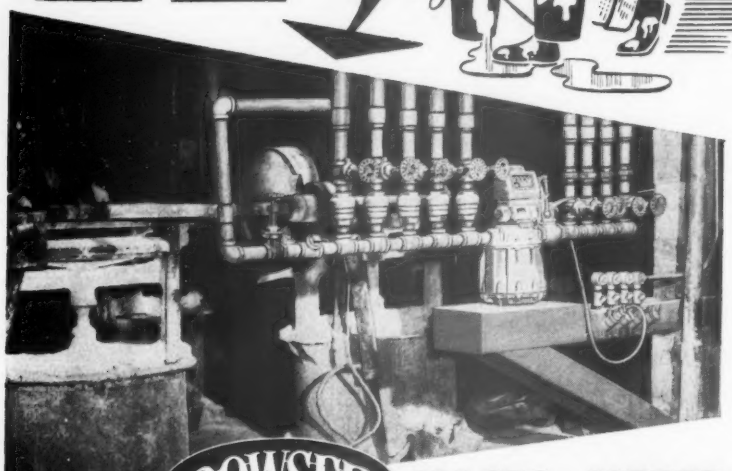


Model 18-S-12 Varnish Filter (steam jacketed)



# The OLD WAY WAS NEVER EASY LIKE THIS



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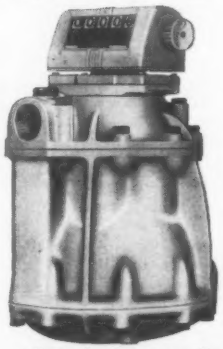

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# TECHNICAL Bulletins

### FORMALDEHYDE HANDLING

28-page manual is concerned with handling aqueous formaldehyde (Formalin) and presenting detailed information on receiving and unloading, temperature control, storage, safety and personnel protection, and methods of analysis, etc. Celanese Corp., of America, Chemical Div., 180 Madison Ave., New York 16, N. Y.

### PAINT ADDITIVES

Three-page technical bulletin discusses the uses of Raybo 6 and Raybo 94 for controlling sagging and settling, and for improving dispersion. Recommendations in specific applications are presented together with the specifications of the two above products. Request technical bulletin no. 11a from Raybo Chemical Co., Huntngton, W. Va.

### DEODORANT

Four-page progress report discusses "Deodall #1", and how it is used as a deodorant or masking agent in various applications. One application is in a fire-retardant coating, where this deodorant removes an objectionable odor. This report may be obtained from the Sindar Corp., 330 W. 42nd St., New York 36, N. Y.

### OUTDOOR ACRYLIC PAINTS

The first progress report on the performance of Rhoplex AC-33, acrylic resin emulsion, for exterior paints has recently been published by the Rohm & Haas Co., The Resinous Products Div., Washington Sq., Philadelphia 5, Pa.

Detailed information on the formulation of exterior coatings based on this acrylic emulsion are presented, together with application techniques.

A considerable portion of this report is devoted to exterior exposure experience and results. Structures painted on the exterior with such coatings are also included.

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### SMALL FORK TRUCK

A new, twenty-eight page treatise, entitled, "Why the Small Fork Truck?", by Nathaniel Warshaw, manager of the Materials Handling Division of Market Forge Co., Everett, Mass., shows how small and medium sized plants can compete with big business in materials handling efficiency.

This book may also serve as a test for teachers and students and will be a useful training aid in industry to provide a better understanding of the design and function of small power trucks.

A unique study, "Why the Small Truck?" analyzes the space, time and labor factors involved in small plant operation and suggests fundamental solutions, derived from Mr. Warshaw's own thirty years of experience in the design and manufacture of materials handling equipment, and based on actual results on their application in plants throughout the world.

### COLORIMETER

Eight-page bulletin (FS-246) published by Fisher Scientific explains the theory and use of a new additive-colorimeter designed to serve as a permanent "color memory" for control chemists in the paint, paper, plasties, linoleum, and printing industries.

While the subject can get pretty technical (tristimulus values and chromaticity are discussed), the informal text should prove valuable to anyone concerned with the problem of color (and color drift is a problem) in industry.

The bulletin on the new Davis-Bruning Colorimeter manufactured and distributed by Fisher is available from Fisher Scientific, 717 Forbes St., Pittsburgh 19, Pa.

### CHEMICALS

Descriptive catalog includes complete information on the company's line of chemicals for use in the glass, ceramic, steel, oil, paint, plastic, and other industries. Available on request from the American Potash & Chemical Corp., 3030 West Sixth St., Los Angeles 54, Calif.

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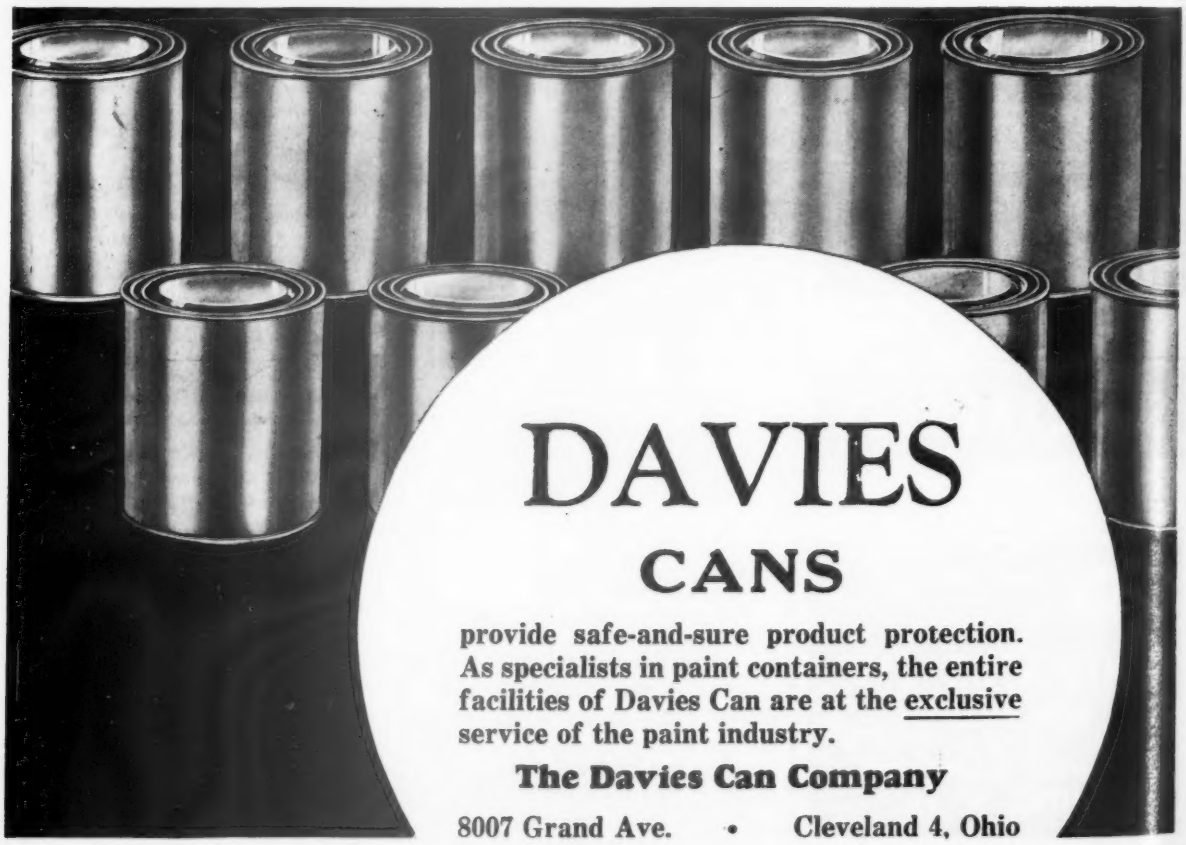

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## Cyanamid's new fast-drying tall oil alkyd resin in VM&P naphtha

**How's this for drying speed!**

Typical High Gloss Titanium Dioxide Enamels
(Pigment/Resin Ratio 70/100)

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| Dust Free | 10 – 15 Minutes |
| Set To Touch | 1½ Hours |
| Tack Free | 3½ Hours |
| Overnight Hardness | Excellent |

**BAKE:** (0.01% Co on Resin Solids) Handle in 10 minutes at 250°F

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Drum Enamels
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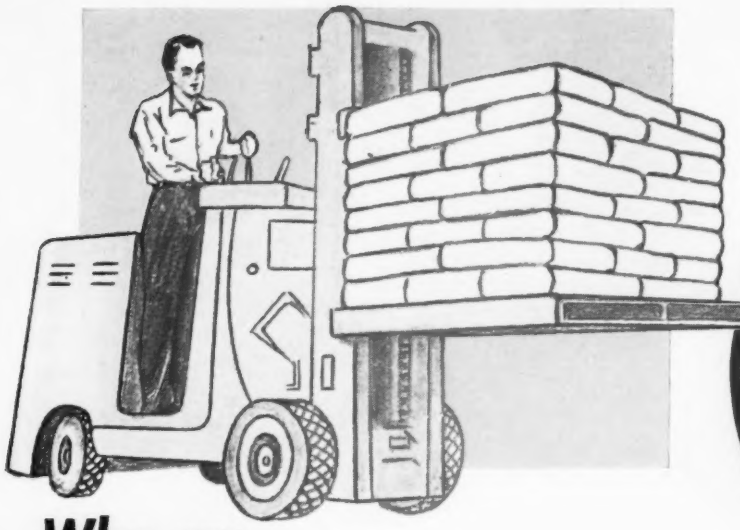

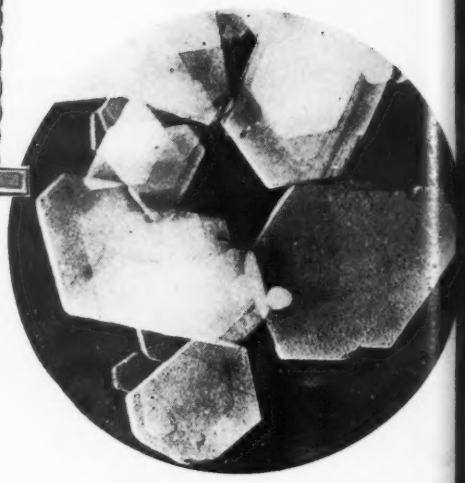

Electron microphotograph showing top view of typical Kaolinite plates —characteristic of particle shape finer than 2 microns, equivalent spherical diameter. Magnified 20,000 diameters.

# *Why are*

# HYDRITE® KAOLINITES

## *used in more than 50% of latex paint production?*

HYDRITE KAOLINITES are derived from a specific form of naturally occurring aluminum silicate, carefully mined and processed. There are many other forms of aluminum silicate with wide variations in chemical, physical and crystallographic structures. However, the unique properties of HYDRITE KAOLINITES have made them the preferred type of aluminum silicate extender.

HYDRITE KAOLINITES exist in two distinct particle shapes—thin, flat, hexagonal plates; and stacks of these plates so firmly cemented together by natural forces that the stacks function as single particles. By means of processes patented by us, we are able to separate the plates from the stacks or to accurately control the ratio of plates to stacks. This ratio determines the characteristics of the individual grades of HYDRITE KAOLINITES and the effect they have on paint properties—gloss, hiding power, viscosity, etc.

HYDRITE KAOLINITES are chemically inert, compatible, easily dispersed, low in abrasion. They have good dry hide, controlled low-soluble salts content, excellent suspending characteristics, outstanding application properties.

For these reasons HYDRITE KAOLINITES are used in over 50% of the latex paints produced in this country—a strong endorsement of the unique qualities of these extenders.

Samples and technical information are available on request.

Side view of typical Kaolinite stack —characteristic of particle shape coarser than 2 microns. Magnified 15,000 diameters.

**Hydrite Kaolinites are produced for the paint trade in the following grades: Hydrite Flat, Hydrite Flat "D", Hydrite PD-121, Hydrite, Hydrite PX, and Hydrite PD-1Q.**

# GEORGIA KAOLIN COMPANY

435 North Broad Street, Elizabeth, N. J.